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U.S. Army Engineer School

(573) 563-8080/DSN 676-8080

COMMANDANT
BG James H. Raymer
563-6192
<james.h.raymer.mil@mail.mil>

ASSISTANT COMMANDANT
COL Jason L. Smallfield
563-6192
<jason.l.smallfield.mil@mail.mil>

DEPUTY COMMANDANT
Mr. James R. Rowan
563-4363
<james.r.rowan4.civ@mail.mil>

REGIMENTAL COMMAND SERGEANT MAJOR
CSM Bradley J. Houston
563-8060
<bradley.j.houston.mil@mail.mil>

REGIMENTAL CHIEF WARRANT OFFICER
CWO5 John F. Fobish
563-4088
<john.fobish.mil@mail.mil>

DEPUTY ASSISTANT COMMANDANT–USAR
COL Kenneth Z. Jennings
563-8045
<kenneth.z.jennings.mil@mail.mil>

DEPUTY ASSISTANT COMMANDANT–ARNG
LTC Bryan M. Carr
563-8046
<bryan.m.carr4.mil@mail.mil>

CHIEF OF STAFF
LTC Geoffrey R. Van Epps
563-7116
<geoffrey.r.vanepps.mil@mail.mil>

COMMANDER, 1ST ENGINEER BRIGADE
COL Heather J. Warden
596-0224, DSN 581-0224
<heather.j.warden.mil@mail.mil>

DIRECTOR OF TRAINING AND LEADER DEVELOPMENT
COL Kevin S. Brown
563-4093
<kevin.s.brown28.mil@mail.mil>

DIRECTOR OF ENVIRONMENTAL INTEGRATION
Mr. Robert F. Danner
563-2845
<robert.f.danner.civ@mail.mil>

COUNTER EXPLOSIVE HAZARDS CENTER
COL Charles G. Phillips
563-8142
<charles.g.phillips.mil@mail.mil>

ASSURED MOBILITY BRANCH, MSCoE CDID, RDD
LTC Larry J. Lyle Jr.
563-5055
<larry.j.lyle.mil@mail.mil>

ENGINEER DOCTRINE, MSCoE CDID, CODDD
LTC Sally C. Hannan
563-2717
<sally.c.hannan.mil@mail.mil>

ORGANIZATION BRANCH, MSCoE CDID, CODDD
LTC Leonard B. Scott IV
563-6282
<leonard.b.scott.mil@mail.mil>

By Order of the Secretary of the Army:

MARK A. MILLEY
General, United States Army
Chief of Staff

Official:



GERALD B. O'KEEFE
Administrative Assistant to the
Secretary of the Army
1534401

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U.S. ARMY ENGINEER SCHOOL

COMMANDANT

Brigadier General James H. Raymer

MANAGING EDITOR

Diana K. Dean

EDITOR

Rick Brunk

GRAPHIC DESIGNER

Jennifer Morgan

Editorial Assistant

Cynthia S. Fuller

Front cover: Top–Soldiers from the 501st, 310th, and 341st Engineer Companies hook up bridge components to a Chinook helicopter during Operation River Assault 2015 at Fort Chafee, Arkansas.

Left–A Soldier from the 74th Multirole Bridge Company, 2d Combat Aviation Brigade, operates a small boat as three UH-60 Black Hawks fly over in Yeoju, South Korea.

Middle–A combat engineer with the 402d Engineer Company, U.S. Army Reserves, places a field expedient Bangalore torpedo during an in-stride breach event at Fort McCoy, Wisconsin.

Right–U.S. Army Reserve Soldiers with 2d Platoon, 323d Engineering Clearance Company, prepare for a route clearance mission at the Combat Support Training Exercise at Fort McCoy.

Back cover: U.S. Army photo.

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Clear the Way

Brigadier General James H. Raymer
Commandant, U.S. Army Engineer School



The new Army Operating Concept defines mobility as "the capability that permits military forces to gain positions of relative advantage, conduct high-tempo operations, and concentrate combat power against decisive points while operating dispersed across wide areas." Mobility is mentioned in various places in the concept, including the following passages: "the mobility to concentrate rapidly"; "combined arms units that possess the mobility, firepower, and protection to defeat the enemy"; "units possess the mobility, protection, and precision firepower that allow them to fight for understanding and identify opportunities to seize, retain, and exploit the initiative"; "forces have the mobility, protection, and firepower necessary to strike the enemy from unexpected directions"; and "combined with firepower and protection, mobility at the tactical level allows Army units to gain positions of relative advantage and overmatch the enemy in close combat."[1]

Though outdated as official doctrine, Field Manual 5-101, *Mobility*, contains the factual statement, "U.S. forces must be prepared to fight under the most severe of these environments as well as under conditions created by terrorism, unconventional warfare, or minor conventional conflicts. To win the next war, U.S. forces must be able to move decisively in all directions without loss of momentum. They must also analyze and acquire targets quickly and precisely to maintain this momentum. To do this, proper mobility planning is essential."[2]

The Army Operating Concept advises that "Thinking clearly about future armed conflict requires consideration of threats, enemies, and adversaries, anticipated missions, emerging technologies, opportunities to use existing capabilities in new ways, and historical observations and lessons learned."[3]

Are we accurately considering the threats, anticipating the missions, and looking at historical operations to provide assured mobility to the combined arms team in the decisive-action environment? The Battle of Kursk in July 1943 provides some insights to threats to mobility and anticipated missions in a decisive-action environment, as learned firsthand by the German army.

"There were so many minefields, and with their well-camouflaged layouts so often overlapped . . . many of these were 'box mines' in wooden casings . . . they also had the advantage of being undetectable by standard minesweeping equipment. Clearing such a field too often meant probing the ground with bayonets. As a deterrent to prospective heroes, the minefields also included improvised flamethrowing devices based on a mine linked to several gasoline bombs,"[4] and "not until 4:00 p.m. was the *[Leibstandarte]* division headquarters sufficiently satisfied to report success after 'bitter fighting.' And that success was highly contingent on the ability of specialist pioneers to throw stable bridges over the Psel [River] during the night."[5]

On Leyte Island in the Philippines from 1944 to 1945, forced-entry operations followed by intense fighting to clear the enemy found that "advancing infantry suffered long waits, sometimes under mortar and artillery fire, while engineers repaired bridges for tanks and checked for mines. There were never enough engineers."[6] After action reviews of the landings also noted that "It is foolish to land large numbers of vehicles if there are insufficient engineers to maintain the roads."[7]

Current operations in eastern Ukraine point to the requirement for the mobility of units in the defense to mitigate risk to the force. As one military expert wrote: "The increased availability of overhead surveillance, combined with massed area fires of artillery and MLRS [multiple launch rocket systems], has produced a new level of intensity in modern conventional combat. In theory, this should be to the advantage of the defense because it increases their awareness of offensive movement and concentration and the attacker is more exposed to lethal fires. However, when the defender is unable to conduct a maneuvering defense (due to a lack of heavy armor and long-range antitank guided missiles), light infantry in fixed positions become extremely vulnerable to the attacker's (unmanned aerial vehicle) target acquisition and massed fires."[8]

As we plan training and exercise scenarios, from home station to combat training centers and combined and joint

(continued on page 5)

Lead the Way

Command Sergeant Major Bradley J. Houston
Regimental Command Sergeant Major



Greetings! After passing the 5-month mark in this position, I must first say how proud I am of our great Regiment. I will also discuss a number of initiatives that will impact the Engineer Regiment and the entire U.S. Army. Some initiatives that have drawn a great deal of attention are the new Noncommissioned Officer Evaluation Report (NCOER); the Select, Train, Educate, and Promote (STEP) initiatives; the reintroduction of common core instruction into the Noncommissioned Officer Professional Development System; and the use of the One Army School System (OASS).

The new NCOER took effect on 1 January 2016 as NCO evaluation entered a new era. Our old evaluation system proved to be too inflated to allow the selection of the NCOs who were best suited for promotions, broadening assignments, and other opportunities. In effect since 1987, the old system failed to evaluate NCOs and identify talent using the current Army leadership requirements model from Army Doctrinal Publication 6-22, *Army Leadership*.[1] I encourage leaders at every level to become familiar with the new evaluation system and give junior leaders the opportunity to attend training with installation trainers. Proper education, communication, and counseling will make this transition seamless as we usher in this new era.

The next initiative I want to highlight is STEP. The policy, outlined in Army Directive 2015-31, *Requirements for Noncommissioned Officer Promotions*,[2] became effective 1 January for semicentralized promotions to staff sergeant and sergeant, for fiscal year 2016 centralized Regular Army and U.S. Army Reserve sergeant first class selection boards, and for the fiscal year 2016 Army National Guard promotion cycle. The policy, which requires NCOs to attend required professional military education before they can be promoted, addresses the backlog of 14,000 NCOs who have not completed the required schools. It also tightens deferment policies to ensure that NCOs get to the required schools.

I recently visited Fort Knox, Kentucky, to discuss these initiatives with representatives from the U.S. Army Human Resources Command, talk with senior leaders of the 19th Engineer Battalion, and host a professional development session with battalion NCOs. I want to thank Command Sergeant Major Patrickson Toussaint and the entire Seahorse Battalion for being gracious hosts.

Another U.S. Army Training and Doctrine Command initiative is the addition of the common core curriculum to the Advanced Leader and Senior Leader Courses. After an initial conference that was attended by representatives from all Army proponent schools, we are well on our way to laying out a course map that will ensure that NCO education better prepares NCOs to execute their daily duties.

Coupled with this initiative is an effort to maximize the use of the OASS. In an effort to understand our regimental training enterprise, I visited the 164th Regional Training Institute (commonly referred to as the Fort Leonard Wood of the North), in Devils Lake, North Dakota. While its instructional facilities, training sites, and accommodations are first class, what struck me most was the commitment of the cadre assigned to the institute. As we leverage the OASS, NCOs who have the opportunity to train there should know that they will receive quality instruction from some of the most professional cadre members that I have ever met. Kudos to Command Sergeant Major Alan P. Grinsteinner and Colonel Jackie Huber for establishing a climate that breeds excellence. I look forward to visiting other Army National Guard and U.S. Army Reserve training locations. I am confident that I will find the same high-quality, committed leadership in place.

I encourage all sergeants major to participate in the next Regimental Command Sergeant Major's Quarterly Forum. Dates for the forum will be announced via e-mail. I ask for your feedback on desired topics so that we in the U.S. Army Engineer School can better communicate with all engineers.

Until next time, *Essayons!*

References:

[1]Army Doctrinal Publication 6-22, *Army Leadership*, 10 September 2012.

[2]Army Directive 2015-31, *Requirements for Noncommissioned Officer Promotions*, 13 August 2015.

Show the Way

Chief Warrant Officer Five John F. Fobish
Regimental Chief Warrant Officer



Greetings all! As I write this, it has been 4 months since I assumed this position; every day has been a great experience. Working with this team of leaders has been awesome, and the work that is being accomplished on behalf of the Engineer Regiment is nothing short of inspirational. I am convinced that the Engineer Regiment of the future will be healthy and extremely competent as we move into the years of Force 2025 and Beyond.

Since assuming my position, I have witnessed the caliber of leaders—commissioned officers, warrant officers, and noncommissioned officers from all components—who are being trained here at the U.S. Army Engineer School and I must say that it is impressive. It is encouraging to know that the Regiment is filled with strong, competent young men and women who stand ready to support when our Nation calls.

As the Army transitions, a cascading effect that impacts every branch and component is taking place throughout its formations. One such effect within the Engineer Regiment is the integration of brigade engineer battalions (BEBs) into brigade combat teams (BCTs). This integration is meant to enhance engineer capabilities and the capacity of the BCTs to support the efforts of mission commanders to achieve a position of relative advantage on the battlefield. Although this landpower portion of the transition is very important, it is not the complete answer to the capabilities challenges that we face. The other important capability required to win is found in the human dimension. This is the dimension where we invest in our most precious commodity—our personnel—with the purpose of optimizing Soldier and team performance while developing adaptive and innovative leaders to understand and operate in a complex environment.

The integration of BEBs will provide BCT commanders with the engineering assets needed to conduct a baseline of combat capabilities that can be augmented with specialized units from the echelon above brigade.[1] This integration has a direct impact on the placement, use, and capabilities required of construction engineering technician (Military Occupational Specialty [MOS] 120A) warrant officers, as they specialize in horizontal construction support as part of the BEB maneuver support effort. The geospatial engineering technician (MOS 125D) and engineer equipment maintenance (MOS 919A) warrant officers are currently not as challenged, but they will also benefit from identifying the capabilities that could be required of them in the future.

As we continue to transition into an expeditionary, deployable force with capabilities to win in a complex world, we must identify and describe the capabilities that will be required for us to achieve success when confronting the unknowns of future conflicts. As the technical experts, warrant officers must strive to support the commanders of our engineer formations as they support the mission commanders to achieve success on the battlefield. We must start by educating and challenging our warrant officers to be the adaptive, innovative officers and leaders of tomorrow. To achieve this objective, I have asked senior engineer warrant officers to include training developers and senior instructors in efforts to identify and describe the capabilities that we think would be required to support the BEBs and the Army in Force 2025 and Beyond. As a result, several working groups have been established to develop a strategy to build a capability within warrant officers throughout the Engineer Regiment.

There are three areas that I believe we must consider in order to be successful in this effort. First and foremost, we must determine what future capabilities will be required to ensure that engineer warrant officers are successful at the BEB and throughout engineer formations. Considering that we are working with the unknown and the unknowable, we

"It is encouraging to know that the Regiment is filled with strong, competent young men and women who stand ready to support when our Nation calls."

can safely assume that warrant officers will be required to support the BEB engineering mission in the BCTs by performing many tasks that are MOS-specific and other tasks that are not. Identifying those capabilities will be critical as we strive to enable successful engineering support to mission commanders.

Second, as we identify these capabilities, we must ensure that we assess the most highly qualified individuals for entry into the engineer warrant officer program so that they have the requisite expertise, a commensurate level of maturity, and the aptitude necessary to meet those future capabilities and challenges. They must also possess the intangible qualities that will help make them the talented leaders of character that the Army will need in the future. Finally, we must be certain that we enhance our institutional education by incorporating and, where necessary, revising the curriculum to include those identified capabilities as requirements. We must take advantage of opportunities to obtain credentials, certifications, and training-with-industry positions while remaining nested within the goals and direction of the Army Operating Concept. The end result will be an engineer warrant officer who is capable of—

- Expertly executing core competencies and technical skills at a level expected of officers in the profession of arms.
- Thinking critically.
- Anticipating and communicating mission requirements.
- Providing a level of expertise that will enable the success of the BEB, the BCT, the mission commander, and the Army to win in a complex world.

As I communicate with commanders and warrant officers at the Engineer School and in the field, I am convinced of the value-added expertise that engineer warrant officers provide to the BEB. To ensure that we continue to provide that value and identify future capabilities as the BEBs stand up and evolve, I encourage you to participate in your future as our roles continue to expand to meet Army requirements. As your leaders are learning how to properly use you, keep them informed about what works and what doesn't work. Relay that information back to the institution so that it can be captured, studied, and integrated into the curriculum to enhance the education program. Continue to network and communicate with your peers who are operating in similar environments to ensure commonality of use across the Engineer Regiment and the Army.

I encourage all senior engineer warrant officers to reach out to junior warrant officers in their area of operation. Help them to develop their areas of technical expertise, to function in capacities that will broaden their experience, to mature as leaders, and to ensure that their commanders achieve mission success. After accomplishing these objectives, we will have capable, professional, and ethical warrant officers who are the technologically agile, adaptive, and innovative leaders who will maintain Army capability overmatch while reducing logistical demands for Force 2025 and Beyond.

Until next time, *Essayons*.

Reference:

[1]Army Techniques Publication 3-34.22, *Engineer Operations—Brigade Combat Team and Below*, 5 December 2014.

("Clear the Way," continued from page 2)

exercises and Force 2025 maneuvers, make certain that your preparations accurately portray threats to the mobility of the force and anticipated missions to assure mobility! It is easy to eliminate bridging and explosive-hazard clearance from the mission set in training in favor of maintaining tempo. Doctrine and experience show that this omission is imprudent in accurately depicting the nature of the high-intensity battlefield and in creating the demand signals for future capabilities development. Let us think clearly on this issue.

Endnotes:

[1]U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-3-1, "The U.S. Army Operating Concept, Win in a Complex World," 31 October 2014.

[2]Field Manual 5-101, *Mobility*, 23 January 1985.

[3]TRADOC Pamphlet 525-3-1.

[4]Dennis Showalter, *Armor and Blood: The Battle of Kursk,* Random House, New York, 2013, pp. 63–64.

[5]Ibid., p. 172.

[6]Max Hastings, *Retribution: The Battle for Japan, 1944–45*, Vintage Books, New York, 2009, p. 129.

[7]Ibid., p. 130.

[8]Philip A. Karber, *Lessons Learned from the Russo-Ukrainian War–Personal Observations* (Draft), Potomac Foundation, 2015, p. 41.



LICENSES AND CERTIFICATIONS:

Expanding and Verifying Professional Excellence in the Engineer Regiment

Compiled by the Department of Instruction, U.S. Army Engineer School

For the Engineer Regiment credentialing efforts to be successful, leaders, supervisors, and mentors must understand the breadth of credentials available to help subordinates set long-term professional development goals. This article describes the purpose and requirements of three licenses and several certifications related to Engineer Regiment capabilities and missions. Although there are other relevant credentials, those discussed below are relevant to a variety of engineer military occupational specialties (MOSs) and grades as credentialing goals that are achievable when combined with complementary educational goals. Achieving any of these credentials can improve and validate the professional competency of U.S. Army engineers and can greatly assist in their transition following military service.



Horizontal engineers with a bachelor's degree in geology are likely candidates for a registered professional geologist license.

It is useful to understand the differences between licenses and other credentials and how they are used in government and industry. Licenses are required by state laws and enforced by state licensing boards. National councils representing the various state boards establish recommended standards for education, experience, testing, and continuing professional development. State legislatures can adopt the recommended standards or change them, based on individual state concerns. States can change the scores required to pass the standard examinations, require different examinations, require or accept different degrees, or require more or less professional experience.

States can require licenses by passing two types of acts—practice acts and title acts. Practice acts mandate the license for the practice of the licensed discipline and for the use of the title. For example, most states use practice acts to regulate architecture and civil, electrical, and mechanical engineering. Only licensed individuals can practice or approve of work in these



Military experience as a construction engineer supervisor can lead to numerous careers in the civilian construction industry.

professions. Title acts mandate a license only for the use of a title, but not for practice of the discipline. For example, some states use title acts to regulate the use of the titles of agricultural or industrial engineer. Other licensed engineers (or those who are not engineers) may legally perform and approve work in these disciplines as long as they do not refer to themselves as agricultural or industrial engineers.

States can also require an additional license to authorize the use of a title and the practice of work meeting specific criteria. For example, civil engineers with a structural specialization can design the structure of buildings in most states but only a licensed structural engineer can design the structure of public schools or civic buildings in California or tall buildings in Illinois.

With limited exceptions, nonlicense credentials are not required by law. They are generally established and overseen by organizations or associations that establish common standards, procedures, or knowledge for a discipline or profession. These organizations usually have members and leaders representing many corporations and governmental agencies who help write and approve the standards. Credentials awarded by these organizations validate an individual's ability to perform a job. Not all credentials are valuable; a credential from an organization whose only reason for existence is to provide credentials should be researched thoroughly before being trusted. Even if there is no legal requirement to possess a credential to do a certain job, having the right credentials can help significantly in getting a good-paying job following military service.

Most of the exceptions where nonlicense credentials are required by law are government credentials that are required to perform certain government or government-funded jobs. For example, the Defense Acquisition Workforce Improvement Act is a law enacted by Congress requiring certification, achieved by experience and training, to perform certain acquisition-related federal government jobs in 14 career fields.

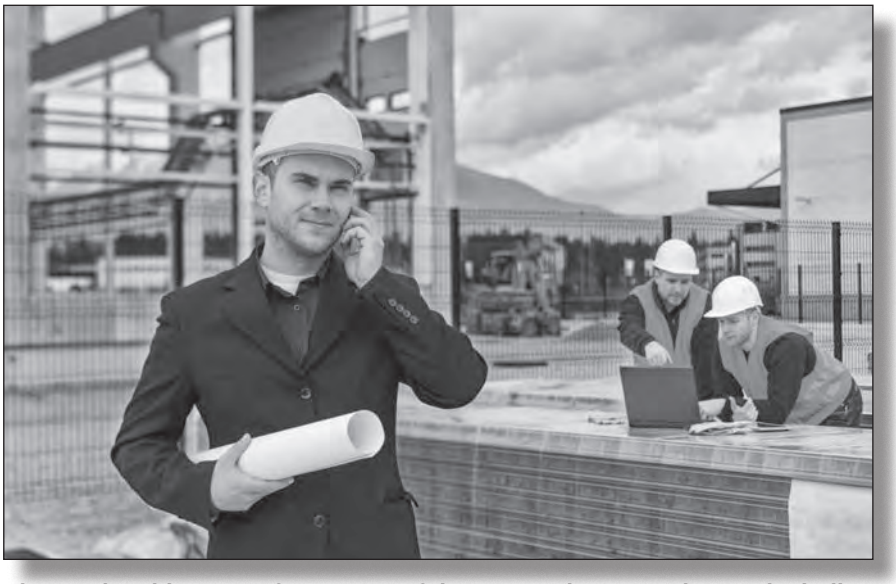
Professional Engineer and Structural Engineer Licenses

The professional engineer (PE) license is one of the most recognized credentials in the civilian and military sectors. There are legal requirements to be a licensed PE to practice many engineering disciplines and to sign and seal engineering plans and drawings. The structural engineer license, while similar to the PE, carries increased requirements. Some states recognize and require a structural engineer license for the structural design of specific large or public structures.[1, 2]

There are four main requirements for becoming a PE:

- Completing a bachelor of science degree accredited by the Accreditation Board for Engineering and Technology (ABET) Engineering Accreditation Committee (EAC).
- Passing the Fundamentals of Engineering examination.
- Completing 4 years of relevant experience supervised by a PE.
- Passing the PE examination.

Many universities offer resident ABET-EAC–accredited bachelor's degrees in engineering disciplines. Online accredited degrees are now available, making it feasible to complete degree requirements even while on active duty. The University of North Dakota was the first to offer primarily online accredited degrees in chemical, civil, electrical,



Licensed architects perform many of the same roles as engineers, including approving construction drawings and specifications and serving as project and construction managers.

mechanical, and petroleum engineering. A small number of laboratory credits are required for each degree, completed in 1- or 2-week resident phases, unless credit is given for laboratory work done during professional military education or at another university. Those interested in pursuing the PE should note that engineering technology degrees accredited by the ABET Engineering Technology Accreditation Committee do not meet qualifying requirements for the PE in most jurisdictions.

The ideal time to attempt the Fundamentals of Engineering examination is immediately before or after graduation to avoid having to relearn material. Some universities even require taking the examination as a graduation requirement. The examination is offered in six discipline-specific versions for chemical, civil, electrical, environmental, industrial, and mechanical engineering and in a general examination for all other disciplines. All versions are offered year-round and consist of 110 multiple-choice questions with a 6-hour time limit.

Time spent working in most engineer units and participation in some engineer professional military education count toward the experience required. Fortunately, there are many PEs in the Engineer Regiment who should be eligible to sign experience documentation. While a USACE assignment provides the best experience in preparation for the PE examination, such an assignment is generally not necessary to meet the minimum eligibility requirements for the examination.

The PE examination is offered in 25 different versions based on the discipline and on further specialization within certain disciplines. Each examination version is administered in two 4-hour blocks. Civil, electrical, and mechanical PE candidates must also declare a specialization, which is tested during the afternoon block. The examination is conducted in April and October, with the main disciplines offered both months. Examination for the smaller disciplines are offered once a year, in either April or October.



Many military engineer careers can prepare Soldiers for civilian jobs in construction management.

Registered Architect License

Similar to the PE for engineering disciplines, there are legal requirements in all 50 states to be licensed as a registered architect (RA) in order to use the title *architect*, to practice architecture, and to sign and seal or stamp architectural construction drawings and documents. In the architecture, engineering, and construction industry, architects perform many of the same roles and responsibilities as engineers, including project and construction managers. In the design phases of a building project using traditional project delivery methods, the project owner contracts with an architect to design a project. Engineers from various disciplines (typically structural, civil, mechanical, and electrical) are consultants who are subcontracted by the architect.

There are three main requirements for becoming a registered architect:

- Completing a professional degree in architecture accredited by the National Architectural Accrediting Board (NAAB).
- Completing the 2-year Intern Development Program (IDP)—to be renamed the Architectural Experience Program (AXP) later this year—through the National Council of Architectural Registration Boards.
- Passing all sections of the Architectural Registration Examination (ARE).

The only degrees accredited by the NAAB are the 5-year bachelor of architecture and the 1- to 3-year master of architecture degrees. Curricula include courses that cover knowledge shared with disciplines related to architecture, such as architectural, civil, structural, electrical, and mechanical engineering, in addition to courses in professional practice management and architectural design. Graduates of bachelor of science in architecture or environmental design programs (which includes the majority of architecture majors commissioned as engineer officers) will require a master of architecture degree to qualify for licensure.[3] No completely online master of architecture program exists, but Southern Illinois University at Carbondale has a 42-credit program with all but two courses offered online. Those two courses are design courses that are conducted in St. Louis, Missouri, in 3- or 4-weekend sessions each. This makes it feasible for engineers assigned to Fort Leonard Wood, Missouri, to obtain the degree. Lawrence Technical University, Southfield, Michigan, also has a blended program of online classes with a 5-week resident summer session near Detroit, Michigan. Master of architecture degrees at other schools can be pursued through Advanced Civil Schooling or the Graduate School for Active Duty Service Obligation programs.

The 2-year IDP/AXP requires at least 1 year of experience supervised by a licensed architect in an organization engaged in the lawful practice of architecture, such as a USACE district. The remainder of the IDP/AXP can be supervised by a PE or RA in a wide variety

of work settings, including tactical engineer units. Completion of the Engineer Basic Officer Leader Course can provide roughly 10 percent of the total requirement. The IDP/AXP is a prescriptive program with mandatory experience hours in 17 areas related to the design and construction of buildings, such as—

- Project cost and feasibility.
- Project management.
- Codes and regulations.
- Construction contract documents.
- Construction contract administration.



The master of geological engineering degree offered by the Missouri University of Science and Technology can be the first step to a career as a registered geologist.

In June 2016, the program will be realigned into six areas of experience covering practice management, project management, programming and analysis, project planning and design, project development and documentation, and construction and evaluation. Because of the structured nature of the program, anyone with an architecture degree should enroll in the IDP/AXP to document experience as soon as possible and request an assignment to a USACE district with a military programs mission to fulfill all the IDP/AXP requirements.[4]

The current version of the ARE, which expires in June 2018, includes seven examination divisions, all scheduled and paid for individually, with a total of 555 multiple-choice questions and 11 building design problems that test the ability to integrate programmatic, structural, mechanical, building code, zoning, and Americans with Disabilities Act requirements in building and site designs. In late 2016, a new version of the examination, with six divisions that align directly with the six new IDP/AXP areas, will be introduced.[5]

Registered Geologist/Professional Geologist License

Similar to other professional licenses, the registered geologist or professional geologist license is intended to help ensure the health, safety, and welfare of the public; the preservation of the environment; and the economic feasibility of constructed projects. However, unlike an engineer or architect, a licensed geologist does not design or build structures. A geologist is responsible for investigating and interpreting earth materials and processes to advise and inform the project designer about how to compensate for existing geological conditions to ensure the feasibility and safety of engineered works. Engineers take this information and work with geologists to determine how to design and build safe structures.

Currently, 30 states and Puerto Rico have laws for licensure or registration of geologists. Each state has different education requirements that can be found on the Association of State Boards of Geology and state Web sites. There are four main requirements for becoming a professional geologist that are common to all states:

- Completing a bachelor of science or bachelor of arts degree in geoscience.
- Passing the Fundamentals of Geology Examination
- Completing the years of experience required by the state board. (This varies from 3 to 7 years).
- Passing the Practice of Geology Examination.

Some states accept degrees in geological engineering, and some states accept master's degrees, making it possible to qualify for licensure after completing the master of geological engineering cooperative degree through the Missouri University of Science and Technology at Rolla. The 4-hour Fundamentals of Geology Examination, which consists of 140 multiple-choice questions, can be taken upon degree completion. In some states, a candidate who passes the examination is referred to as a geologist in training while attaining the required work experience.

When the state board determines that a candidate has met all other requirements, it gives approval to take the Practice of Geology Examination. This examination is a 4-hour, 110-question test based on the application of knowledge. Both examinations are offered in September/October and March of each year and may be taken on the same day.[6]

Likely candidates include engineer officers with undergraduate degrees in geological studies and Engineer Captains Career Course or construction engineering technician (MOS 120A) Warrant Officer Advanced Course graduates who complete the master of geological engineering degree. The registered professional geologist license is also a relevant and achievable goal for some technical engineer (MOS 12T), horizontal engineer (MOS 12N), or geospatial engineer (MOS 12Y) noncommissioned officers (NCOs), especially with qualifying online degrees, such as a bachelor of science in geology, now available from the University of Florida.

Certified Associate in Project Management and Project Management Professional

The Project Management Institute® (PMI) is the one of the largest and most recognized professional membership organizations dealing with project, program, and portfolio management. The institute's book, *A Guide to the Project Management Body of Knowledge*[7] (commonly

known as PMBOK), is used as a standard for project management in different industries and professions. PMI offers several credentials, but the Certified Associate in Project Management (CAPM) and the Project Management Professional (PMP) credentials are the logical choices that most leaders in the Engineer Regiment can achieve.

The CAPM demonstrates an understanding of project management processes, but with less experience than the PMP. Examination eligibility is achieved through either 23 project management education hours or 1,500 hours of project management experience, making it attainable for many staff sergeants, warrant officers one, or second lieutenant engineers. The 3-hour examination has 150 multiple-choice questions. Though this is an entry level credential, passing the CAPM examination before taking any other PMI examinations is not required.

The PMP is the capstone credential for project managers. It validates competence in the role of a project manager. It takes more experience and education to achieve this credential, including a bachelor's degree in any discipline, 4,500 hours of experience in project management, and 35 hours of project management training. Most sergeants first class, warrant officers two, and commissioned officers in grades captain and above should be able to document the experience necessary to qualify. The 4-hour examination has 200 multiple-choice questions.

The CAPM and the PMP examinations are offered year-round and are typically computer-based and taken at a Prometric testing site.[8] It is possible for organizations to schedule local paper examinations, sometimes at reduced applicant cost, though test scoring takes much longer.

Project management experience comes in many different forms, so leaders from any type of unit may be eligible to take the PMP examination. The PMP certification is highly regarded within the Engineer Regiment (and in many civilian sectors). Most leadership roles require project management skills, so studying for and obtaining these credentials will be beneficial to any leader. PMI estimates that civilian project managers who hold a PMP certification typically earn 17 percent more per year than those without the certification.[9]

Courses leading up to both credentials are available. Online PMP preparation courses are available at no cost at <https://usarmy.skillport.com>. Courses provide all the needed study materials, including a copy of the PMBOK. The CAPM examination costs $300, and the PMP examination costs $555.[10]



The CAPM and PMP credentials are logical choices that most Army engineer leaders can bring to civilian careers.

Certified Construction Manager

The Certified Construction Manager (CCM) is the industry-standard certification in the construction management profession. Those who earn the CCM have certified abilities to apply effective management techniques to the planning, design, and construction of a project from inception to completion for the purpose of controlling time, cost, and quality. CCMs are highly marketable and are accredited by the Construction Managers Certification Institute, which is affiliated with the Construction Management Association of America (CMAA).[11] Some project owners, such as the General Services Administration (GSA), prefer to hire firms that use the CMAA construction management standards of practice and have CCMs on the project staff. The CCM complements a license in engineering or architecture and is also a very valuable stand-alone credential.

All CCM candidates are required to have the mandatory minimum of 48 months of experience during which they were *responsible in charge* of key functions during each phase of a project or program. The definition of responsible in charge does not require that an applicant be the final decisionmaker on all aspects of each project from start to finish for a total of 4 years. Rather, CMAA outlines 30 experience areas from six project functions over the five phases of a project. For each area, applicants must have some experience in which they were empowered to make decisions that directly impacted the successful completion of a project and were responsible for construction management in that particular experience area. There is no minimum requirement for each experience area, and a unit commander can validate an applicant's experience. For example, anyone who was a designated contracting officer representative for a few months during the final phases of a small construction project could receive credit for all required experience in at least four experience areas:

quality management and contract administration in both the construction and postconstruction phases.

CCM applicants with a bachelor's or master's degree in a qualifying discipline require only the minimum 48 months of responsible in charge experience. Qualifying degrees include—

- Construction management.
- Construction technology.
- Construction science.
- Architecture.
- Civil engineering.
- Electrical engineering.
- Industrial engineering.
- Mechanical engineering.
- Architectural engineering.

Applicants without a bachelor's or higher qualifying degree need additional general design or construction experience to qualify: 4 years for those with an associate's degree in a qualifying discipline and 8 years for those with no college degree or with degrees in nonqualifying disciplines.

The CCM examination is a 5-hour test with 200 multiple-choice questions that cover project management, cost management, time management, contract administration, quality management, professional practice, and safety and risk management. Only 175 questions are graded; 25 are pilot questions. In preparing for the examination, the Construction Management Certification Institute recommends the CMAA Standards of Practice Study Kit in addition to those listed in the construction management core competencies.[12]

Likely candidates for the CCM are—

- General engineers (commissioned officers in MOS 12A and warrant officers in MOS 120A).
- Construction engineering supervisors (NCOs in MOS 12H).
- Horizontal construction engineers (NCOs in MOS 12N).
- General engineering supervisors (NCOs in MOS 12X).

Meeting the CCM eligibility requirements may seem difficult, yet it need not. It is possible that an NCO with as few as 8 years of time in service and a qualifying degree (such as an associate's degree in construction management from Park University at Fort Leonard Wood) could qualify for the CCM. Those who set personal goals to achieve the CCM early in their careers and seek out required experiences should be successful. The experience may be gained by working in their units, by assisting their local Directorate of Public Works or USACE area offices, or even by volunteering with organizations such as Habitat for Humanity or a local church with construction needs. Members of the Engineer Regiment who are interested in applying for a CCM certificate can contact Colonel Don C. Young (retired), P.E., CCM at <dyoung@mbpce.com> for more information.



Engineer equipment maintenance MOSs offer a path to a CEM credential.

Certified Equipment Manager

The Certified Equipment Manager (CEM) credential is an industry standard for heavy equipment fleet and maintenance managers. CEM is one of two credentials available through the Association of Equipment Management Professionals, an association of organizations and individuals involved in managing and maintaining heavy construction equipment. It provides opportunities for continuing education, networking, and professional certification. The association is widely recognized and endorsed throughout the construction equipment industry, with numerous corporate members.

"It is possible that an NCO with as few as 8 years of time in service and a qualifying degree . . . could qualify for the CCM."

Likely candidates for the CEM credential are engineer equipment maintenance warrant officers (MOS 919A), construction equipment repairer NCOs (MOS 19L), and other maintenance warrant officers and NCOs with heavy equipment experience.[13] Applicants must have a minimum of 5 years of experience in equipment management and 25 points, based on criteria including military and supervisory experience, the dollar value of fleets managed, civilian education, and a 200-word personal statement. Any engineer in MOS 919A or 19L with at least 5 years in a supervisory position should easily exceed the minimum eligibility requirements. The application also requires a résumé and letter of recommendation that attests to the applicant's abilities and applications of equipment management.



Army engineer construction experience can lead to credentials such as certified construction contract administrator, certified construction specialist, or others.

Ultimately, any study for the examination will be valuable for leaders who want to increase their professional competence or increase their marketability during a transition-to-industry, municipal, or governmental employment.

The CEM examination is offered twice annually. It tests 20 knowledge areas, all of which are covered in the Warrant Officer Basic Course for MOS 919A. They include—

- Risk management.
- Employee training.
- Environmental requirements.
- Safety.
- Parts management.
- Preventative maintenance.
- Shop and facility management.

Included with the examination fee, the AEMP provides 17 online courses for examination preparation. Though advertised examination fees are high, AEMP has informally agreed to provide a reduced rate of $795 to Soldiers in MOSs 919A and 91L to meet the annual Army credentialing reimbursement limit. For more details, contact Chief Warrant Officer Three Terry W. Tanner with the 919A Professional Development Branch at (573) 596-5102.

Leadership in Energy and Environmental Design

The U.S. Green Building Council (USGBC) is a nonprofit organization that promotes sustainable planning, design, construction, and operation of buildings. Through its Leadership in Energy and Environmental Design (LEED) program, USGBC provides credentials to individual professionals and certification of constructed projects. Many project owners want their projects to be certified as meeting LEED criteria regarding savings of energy, water, resources, and money, while improving occupant health and well-being. This includes the federal government, which uses LEED to verify that new and renovated government and military facilities meet energy use and sustainability mandates. For a project to be LEED-certified, LEED-credentialed staff must work on the project team. The LEED credential is unique because design and construction companies must hire LEED-credentialed individuals to meet the current market demand for LEED-certified projects.

USGBC offers six LEED credentials. An individual with the entry level LEED Green Associate designation is recognized as having general knowledge of sustainable building principles and practices. Following the LEED Green Associate credential, an engineer might specialize with accredited professional (AP) certifications. The AP certification is available in—

- Building design and construction.
- Operations and maintenance.
- Neighborhood development.
- Interior design and construction.
- Homes.

Project experience and college education are not requirements for the LEED Green Associate or AP credentials. USBGC recommends, but does not require, LEED project experience before application. This makes applying for the credential relatively simple. The Green Associate examination consists of 100 multiple-choice questions. Completion of the Green Associate examination is required before taking any of the AP examinations. The tests are administered throughout the year at Prometric testing centers. A knowledge of current trends in the building industry and Army operational energy programs can assist in preparing for the examination. The knowledge required for the Green Associate credential can be useful for any Service member in any construction-related MOS. The AP credentials could be useful while working on a USACE project or during a transition from military service to design, construction, or facility management industries.[14]

Examination resources are available on the USGBC Web site. Members of the Engineer Regiment can join USGBC free of charge and receive member discounts by simply selecting U.S. Army as their company when joining. Using a military e-mail address may facilitate the process. The cost of earning a LEED Green Associate credential is $200, and the cost for AP specialties is $250 for USGBC members.

Construction Specifications Institute Credentials

The Construction Specifications Institute (CSI) was founded in 1948 by specification writers from USACE and the U.S. Navy's Naval Facilities Engineering Command to improve the quality and consistency of construction specifications on an industry-wide basis. Specifications are a critical part of construction contracts and are the means used to describe the type and quality of materials, the quality of workmanship,

the methods of fabrication and installation, and any general requirements related to the construction of a project. MasterFormat®, published by CSI and its Canadian counterpart, Construction Specifications Canada, is the North American construction standard for organizing project manuals and detailed cost information and for relating construction drawings or plans to specifications. The Unified Facilities Guide Specifications,[15] developed and currently used by USACE, the Naval Facilities Engineering Command, the U.S. Air Force Civil Engineer Center, and the National Aeronautics and Space Administration to specify construction projects, are based on the latest version of MasterFormat. In addition to maintaining industry standard formats, CSI provides certifications that are beneficial for those who write specifications or administer construction contracts or just need to understand how the construction industry is organized, operates, and communicates. CSI offers the following certifications that can benefit the Engineer Regiment:[15]

- ***Construction Documents Technologist (CDT).*** The CDT program introduces candidates to the fundamentals of construction: construction documentation, contractual relationships, and relationships and organization of construction documents. The CDT certificate does not require prerequisite education or years of experience to qualify, it never expires, and it does not require continuing education or renewal fees. The candidate must pass a computer-based examination of 120 multiple-choice questions in fundamentals, project concept and delivery, design process, construction documents, procurement, preconstruction, construction, and lifecycle activities. CSI's Project Delivery Practice Guide is the primary study aid for the examination. The registration fee for the examination varies, but the average cost is $430.[16] This certificate is the first step in achieving a CSI certification. The CDT is a beneficial certificate for leaders at all levels with the following specialties:
  - ❑ Engineer officer (MOS 12A).
  - ❑ Construction engineer (MOS 12H).
  - ❑ Horizontal construction engineer (MOS 12N).
  - ❑ Technical engineering specialist (MOS 12T).
  - ❑ Construction engineering technician (MOS 120A).

  The CDT credential bridges the knowledge gap between professional military education based on troop construction and operations orders and the way the construction industry operates and communicates through contracts in the federal and private sectors.
- ***Certified Construction Contract Administrator (CCCA).*** Candidates further their understanding of construction fundamentals in the CCCA program. The CCCA focuses on aspects of the construction process such as quality assurance and quality control, bidding and negotiating, construction inspection, project enforcement, and project liability. The prerequisite for the CCCA examination is the CDT certificate plus 2 years of experience in construction contract administration. The examination consists of 200 multiple-choice questions that test an applicant's understanding of claims and disputes, contracts, project records, quality control and quality assurance, and site visits. Once CCCA-certified, engineers maintain certification by completing 24 hours of professional development over 3 years and remaining active in the field. The examination costs approximately $480.

  The CCCA is an ideal certification for leaders with the same MOSs as those with the CDT credential, including MOSs 12A, 12H, 12N, 12T, and 120A, with experience in construction units, a contracting agency, or USACE.[17] Engineers with CCCA credentials often fill a role similar to that of the administrative contracting officer filled by resident engineers in USACE field offices.
- ***Certified Construction Specifier (CCS).*** The CCS credential is geared toward engineers who write construction specifications. An engineer with detailed knowledge of a construction specialty can make an excellent specification writer in his or her specialty. Applicants must first hold the CDT certificate and have 2 years of experience in the preparation and coordination of specifications used in construction. Applicants must also have 5 years of experience in the preparation of construction documents. The examination consists of 200 multiple-choice questions testing the following topics:[18]
  - ❑ Construction contract types.
  - ❑ Agreements and conditions of a contract.
  - ❑ Changes in the work.
  - ❑ Construction design document organization.
  - ❑ Division 01, general requirements.
  - ❑ Production techniques.
  - ❑ Procurement and contracting requirements.
  - ❑ Specification of techniques and applications.
  - ❑ Specification writing.

  Once CCS-certified, engineers maintain certification by completing 24 hours of professional development over 3 years and remaining active in the field. The examination costs approximately $480.

The CCS is a potential capstone certification for engineers with MOSs 12H, 12N, 12T, or 120A who have significant construction specification experience in their assignments. The CCS credential ensures that the technical requirements in a construction contract are clear and sufficient, increasing the probability that a project that meets all requirements will be completed on time and on budget.

Certified Planner

The American Institute of Certified Planners (AICP) is part of the American Planning Association; and it awards credentials related to urban, regional, environmental, and transportation planning and urban design. The Certified Planner (CP) designation is the AICP

credential most likely to be achieved by Army engineers. This credential validates research and design skills and endorses the ability of a professional to develop programs that enable transportation, environmental, or urban design. The CP credential focuses on nine core competencies and overviews 14 specialty competencies. AICP also offers further certification in advanced specialty competencies, including the Certified Environmental Planner, Certified Transportation Planner, and Certified Urban Designer credentials.[19] With their 8-year experience requirement, these advanced credentials are probably beyond the reach of most Regular Army engineers but would be beneficial and achievable for some Army National Guard and U.S. Army Reserve engineers.

An engineer with a Planning Accreditation Board-accredited undergraduate or graduate degree in urban, city, or regional planning with 3 or more years of planning experience is an obvious candidate for the CP certification. Those with nonaccredited degrees in related or other fields such as architecture, geography, history, or civil engineering require 4 years of experience in planning. A Planning Accreditation Board-accredited graduate degree in planning, such as the online Master of Infrastructure Planning and Management degree from the University of Washington or the online Master of Urban and Regional Planning degree with an optional specialization in geographic information systems from the University of Florida, reduces the experience requirement to 2 years. The annual examination consists of 170 multiple-choice questions.

Endnotes:

[1]National Council of Examiners for Engineering and Surveying, "PE Exam," <http://ncees.org/exams/pe-exam>, accessed on 8 December 2015.

[2]National Council of Examiners for Engineering and Surveying, "SE Exam," <http://ncees.org/exams/se-exam>, accessed on 8 December 2015.

[3]National Council of Architectural Registration Boards, "Studying Architecture," <http://www.ncarb.org/Studying-Architecture.aspx>, accessed on 8 December 2015.

[4]National Council of Architectural Registration Boards, "Intern Development Program," <http://www.ncarb.org/Experience-Through-Internships.aspx>, accessed on 8 December 2015.

[5]National Council of Architectural Registration Boards, "Architect Registration Examination," <http://www.ncarb.org/ARE.aspx>, accessed on 8 December 2015.

[6]National Association of State Boards of Geology, "Candidate Resources: Examination Application Process," <http://asbog.org/registration.html>, accessed on 8 December 2015.

[7]Project Management Institute, *A Guide to the Project Management Body of Knowledge*, Project Management Institute, Newtown Square, Pennsylvania, 1 January 2013.

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[9]Ibid.

[10]Ibid.

[11]Construction Management Association of America, "Becoming a CCM," <http://cmaanet.org/becoming-ccm>, accessed on 8 December 2015.

[12]Ibid.

[13]Association of Equipment Management Professionals, "Certified Equipment Manager (CEM)," <http://www.aemp.org/aemp-education/certifications/cem/>, accessed on 8 December 2015.

[14]U.S. Green Building Council, "Credentials," <http://www.usgbc.org/credentials>, accessed on 9 December 2015.

[15]United Facilities Criteria (UFC), UFC 1-300-02, 1 April 2014, *Unified Facilities Guide Specifications (UFGS) Format Standard*,<http://www.wbdg.org/ccb/DOD/UFC/ufc_1_300_02.pdf>.

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Article contributors:

Lieutenant Colonel H. W. Hugh Darville, Director of Instruction, U.S. Army Engineer School

Captain Iana J. Daniels, Engineer Captains Career Course, small-group leader

Captain Ryan M. Dunbar, Engineer Captains Career Course, small-group leader

Captain Ronald N. Thenn, Engineer Captains Career Course, small-group leader

Captain Joshua A. Henderson, Engineer Basic Officer Leader Course, Chief, General Engineering Division

Captain Drew A. Maci, Engineer Basic Officer Leader Course, instructor / writer

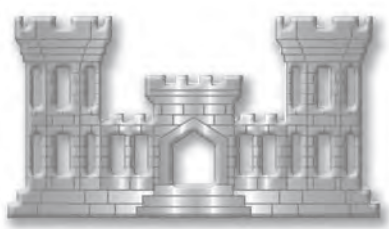
Captain Jason A. Mullen, Engineer Basic Officer Leader Course, instructor / writer

Captain Blaise J. Staub, Engineer Basic Officer Leader Course, instructor / writer

Captain Katherine A. Huffmyer, Engineer Captains Career Course, student, Class 01-16

Captain Nicholas A. Reisweber, Engineer Captains Career Course, student, Class 01-16

Chief Warrant Officer Four Curtis L. Martin, Director, Ordnance Warrant Officer Training, U.S. Army Engineer School



You Just Got Your Project Management Certificate—Now What?

By Captain Gaetano K. Simeti

Several articles in engineer publications describe the process of attaining the project management professional (PMP) certificate and the added value it provides for an engineer's career development.[1, 2] There is a requirement that holders accumulate 60 professional development units (PDUs) every 3 years in a manner prescribed by the Project Management Institute® (PMI) to maintain the PMP. While the number of PDUs to be earned hasn't changed, the requirements for maintaining the certificate were overhauled on 1 December 2015.

PDUs can now be earned through a combination of *education* and *giving back*. According to the new PMI guidance, at least 35 PDUs must be earned through education, which includes three tracks:

- Technical.
- Leadership.
- Strategic and business management.

Conversely, there is a cap at 25 PDUs that can be earned through the three tracks for giving back:

- Volunteering.
- Creating knowledge.
- Working as a professional.

The PMI Web site explains the reason for the change in continuing certification requirements. "Extensive market research and feedback from certification holders and organizations identified a subset of skills which employers require for project practitioners to deliver improved results. These skills areas are represented in the PMI Talent Triangle. The CCR requirements updates align professional development activities, specifically education activities, with the PMI Talent Triangle to ensure certification holders are focused on the needs of the profession."[3]

Holders of PMP certificates due to expire before 1 December 2017 do not need to adhere to the updated CCR rules. Those with certificates set to expire on or after 1 December 2017 must adhere to the updated CCR maximum/minimum PDU reporting rules.

For activities or courses to count toward the education requirement, they must be offered by a PMI Registered Education Provider from the list at <http://www.pmi.org/learning/professional-development/rep-find-a-registered-education-provider.aspx>. The site lists providers for locations around the country, the activities and courses they offer, and contact information for them. The costs of the activities and courses vary greatly. The U.S. Army Corps of Engineers Learning Center offers classes that provide skill enhancement and PDUs at <http://ulc.usace.army.mil/>. Classes can be found by checking the fiscal year 2016 course catalog, also known as the Purple Book, at <http:/ulc.usace/army.mil/downloads/purplebook2016.pdf>. Some classes have already been filled, so attendance requests should be submitted as soon as possible.

Local Chapter Meetings

Attendance at a meeting of the local PMI chapter usually earns one or two PDUs. Attending one meeting a month can earn at least 36 of the required PDUs and possibly all 60, depending on the chapter. PMI members can select a chapter to join from the PMI home page. An online search will reveal the closest chapter. Attendance at meetings, which usually costs $15 to $20, provides a multiplying effect by offering members the opportunity to meet civilian professionals and establish relationships with them before leaving the Army.

Volunteering is another way to earn PDUs and build relationships by allowing members to get involved with the local community in a professional capacity, laying the groundwork for future opportunities. Military liaison is an emerging volunteer role embraced by PMI chapters that are close to military installations. In 2013, a pilot program began with the Tampa, Florida, PMI chapter forming a relationship with U.S. Central Command and U.S. Special Operations Command Soldiers, Marines, Sailors, and Airmen stationed at MacDill Air Force Base. The program goal is to provide information and support on transitioning from the military and finding civilian career options in project management.

(Continued on page 18)



Professional Credentialing at the Unit Level:

3d Infantry Division Shows One Way for Army Engineers to Succeed

By Lieutenant Colonel R. Daren Payne and Major Michael D. Steele

Developing programs for professional credentialing and contracting qualification is not difficult. Over the last 3 years, the 3d Infantry Division, Fort Stewart, Georgia, successfully supported the efforts of 37 Soldiers who attained professional credentialing. This article describes the way the division engineer section helped those Soldiers earn professional credentials, most notably the project management professional (PMP) certificate, professional engineer (PE) licensure, and contracting officer representative (COR) qualification. Despite a new emphasis on professional certification, the Army has not developed a standardized program to attain various professional credentials. Subsequently, funds are not yet available to defray the costs of study materials, preparation courses, and examinations. As a result, most Soldiers who pursue credentials do so on their own time and at their own expense.

Soldiers with PMPs and PEs provide value to the Army, but deciding between pursuing the PMP or PE credential is challenging. The PMP certificate is sought for several reasons. It does not require a science, technology, engineering, or mathematics degree, which makes it available to a larger population. The PMP examination can be scheduled year-round at approved testing centers, the PMP credential is not state-specific, and the credential is internationally recognized. Also, the availability of the PMP examination allows Soldiers to schedule it at a convenient time. In comparison, the PE credential requires a degree in science, technology, engineering, or mathematics; the examination is only available twice yearly; the certification is state-specific; and the certification is not always internationally recognized. Many PEs are also PMPs.

PMP Preparation

Finding time to study and prepare for the PMP examination while assigned to a deployable unit can be a challenge. The 3d Infantry Division engineer

cell implemented a method to identify and assist Soldiers who were interested in earning the credential. A series of information sessions was held to gauge interest and determine who was eligible to sit for the examination. Study groups were held over a period of several months, culminating in a PMP "boot camp" shortly before Soldiers sat for the examination.

The approach leveraged periods of low operational tempo by holding information sessions during the half-day holiday schedule in December. Subsequently, study sessions were conducted on Mondays and Fridays during lunch breaks. The boot camp was held during a week with minimal training schedule conflicts. In 2015, boot camp took place the week before Memorial Day. A certified PMP facilitated each study session. Three or four certified PMPs are usually necessary to ensure that they can juggle their day job commitments with the study sessions. New material was covered on Fridays, and Mondays served as reinforcing days, giving students two opportunities per week to study the material. Scheduling to make use of periods of low operational tempo and provide multiple opportunities for information and study sessions allowed Soldiers to successfully prepare for the examination despite the limited time available.



Engineers from the 3d Infantry Division perform quality assurance for a Fort Stewart project.

PE Preparation

Pursuing PE licensure is inherently challenging. The examination is usually offered only twice yearly and is specific to each discipline, such as civil, electrical, mechanical, and environmental engineering. Unlike the PMP examination, the PE licensure examination is administered differently from state to state. Many states require PE licensure applicants to work under a certified PE for approximately 4 years. The biggest challenge is that PE licensure requires that the applicant pass the Fundamentals of Engineering (FE) examination before sitting for the PE examination. Unfortunately, a surprising number of Soldiers with engineering degrees do not take the FE examination after graduation, making them ineligible for the PE examination until they later pass the FE examination. Therefore, only two to three Soldiers apply for PE licensing every year. Scheduling information sessions, conducting preparation courses, and running study groups for a small population is difficult. Leaders can implement several measures to mitigate this challenge, including—

- Using available licensed PEs to lead information sessions. Directorates of public works and local U.S. Army Corps of Engineers (USACE) offices have PEs who can help.
- Leveraging relationships with USACE districts and professional organizations, such as the Society of American Military Engineers or the American Society of Civil Engineers. USACE offers Web-based PE preparation courses that are free to military engineers, and many professional organizations offer local study group opportunities and affordable preparation course options.
- Advertising the dates for the PE exams early. Dates can be publicized in training guidance, in post-wide messages, and through monthly engineer conference calls.
- Getting acquainted with officials at the state professional licensing board in your state. For example, the director of the Georgia Professional Licensing Board was invited to brief 3d Infantry Division engineers at a Society of American Military Engineers luncheon.

COR Certification

A third important credential is the COR certification, which was one of the credentials most sought after by commanders and engineer leaders during combat operations in Afghanistan and Iraq. Only a contracting officer can appoint a COR—and only after the potential COR has completed several training courses that can require several weeks of work. The 3d Infantry Division started a program that lets engineers complete the coursework to be ready on short notice for appointment as a COR. This program leverages free, Web-based classes and can be completed in about 50 hours. Candidates are allowed to

complete online courses during duty hours, and they must take Defense Acquisition University ethics training annually to maintain certification. Although COR qualification requirements vary, the 3d Infantry Division solution greatly eases the certification process in most instances, allowing a cadre of COR-ready leaders to be developed rapidly.

Payment for Preparation Courses and Examinations

The typical price for a formal, 5-day PMP preparation course is $1,500 to $2,000. PE preparation courses are also expensive, and the fees do not cover travel costs. The 3d Infantry Division identified the following ways to reduce the cost of PMP and PE preparation courses:

- Leverage professional organization networks. The Society of American Military Engineers sponsors a Credentialing Awards Achievement Program that reimburses noncommissioned officers and members under age 40 who pass any one of 11 examinations, including the FE, PMP, and PE examinations. The Savannah, Georgia, chapter of the Society of American Military Engineers funds up to 75 percent of examination fees. Organizations at other installations offer similar incentives.
- Apply the GI Bill toward PMP or PE preparation courses or college classes that help prepare Soldiers for the examinations.
- Invest in the future by using unit training funds for a PMP preparation boot camp. The 3d Infantry Division worked with a company that provides PMP training to conduct classes. Costs are based on enrollment and can be reduced to about $700 per student.
- Establish a relationship with local USACE officials, who often conduct PMP boot camps at their district offices. While prices and terms vary, the camps are usually offered at a significant discount.

Ingredients to Success

There are three ingredients to success. A quality contribution by the study group cadre is necessary for a preparation program. Without the work of these volunteers, the program will not succeed. The program also requires a commitment from the participating Soldiers, who must devote their valuable personal time to prepare for the examinations. The final ingredient is leadership that is committed to developing professionals through improving the knowledge and technical capabilities of the force. Senior leader involvement will pay dividends for years to come.

Conclusion

The 3d Infantry Division engineer section found one way—but not necessarily the only way—to help Soldiers become certified as PMPs, PEs, and CORs. Deliberate scheduling that takes advantage of time and resources enables Soldiers to work on these credentials while reducing personal costs to them or maximizing the use of unit dollars. Experience proves that these efforts will be rewarded when conditions are set for Soldiers to receive the training they need to provide additional value to the Army.

Lieutenant Colonel Payne is the division engineer for 3d Infantry Division. He holds a master's degree in environmental engineering sciences from the University of Florida. He has been a certified project management professional since 2011.

Major Steele is an engineer operations officer for 3d Infantry Division. He holds a master of business administration degree from Utah State University. He became a project management professional in 2015.



("Project Management Professional Certificate," continued from page 15)

Careful emphasis is placed on translating project management skills and terminology from military jargon to a commercial perspective.

Whether it is at the end of a single enlistment or a 20-year career, everyone transitions from military service. Attending PMI meetings exposes engineers to topics they might not otherwise explore. Having a working knowledge and relationship with this community of practice empowers them to make informed decisions when determining the next step of their careers.

Endnotes:

[1]Robert E. Dion, Jr., "Requirements for Becoming a Project Management Professional," *Engineer*, PB 5-13-2, Volume 43, May–August 2013, pp. 31–33.

[2]Stewart R. Fearon, *The Military Engineer*, "The PMP Certification: What You Need to Know," <http://themilitaryengineer.com/index.php/item/343-the-pmp-certification-what-you-need-to-know,> accessed on 11 January 2016.

[3]"2015 Continuing Certification Requirements (CCR) Program Updates," <http://www.pmi.org/certification/ccr-updates/faqs-certification-holders.aspx>, accessed on 11 January 2016.

Captain Simeti is the plans officer for the Directorate of Public Works at the U.S. Army Reserve 63d Regional Support Command at Mountain View, California. He holds a bachelor's degree in marketing from the University of Illinois–Chicago and a master's degree in public administration from Webster University. He is a project management professional.

Way Ahead for Engineer Leaders:

Credentials Certify Experience and Knowledge

By Captain Katherine A. Huffmyer

> *"This is a win-win for the Army and its Soldiers. What better time than now, when the Nation needs an army of Soldiers and leaders with creative and critical thinking skills to accomplish any mission the Nation asks of us? We must be able to give them the most educated fighting force in the world."*
>
> *—Sergeant Major of the Army Daniel A. Dailey*[1]

As the Army moves forward in realigning the force structure, leaders of the Engineer Regiment are doubling their efforts to mold an increasingly competent and competitive fighting force. Coupled with the directive of the Secretary of the Army and the effort led by the U.S. Army Training and Doctrine Command, the U.S. Army Engineer School, Fort Leonard Wood, Missouri, is a staunch advocate of the Army Credentialing Program. As defined by the Department of the Army, credentialing is "the process of meeting certain professional and technical standards and earning official recognition in the form of certificates, licensure, and other official verification of competency accepted by civilian industry or federal, state or local authorities."[2] The pursuit of credentials, whether for self-development, career progression, or a civilian portfolio, enhances professional competitiveness and allows Soldiers to equip themselves with a nationally recognized standard of excellence.

To better serve the 20 technical military occupational specialties (MOSs) within the Engineer Regiment, the Army Credentialing Program incorporates certifications, licenses, and related educational degrees to bridge the gap between military training and experience and provide Soldiers with access to a wide array of certification and licensing examinations.[3] The program will align professional military education in the domain of institutional development with individual, MOS-related experience within the domain of operational development. Ultimately, the program supports the acquisition of credentials within the domain of self-development to achieve technical competency. The goal is to certify the qualifications of Soldiers in their MOSs and increase their competitiveness in the civilian workforce. These certifications will translate military-specific occupations and competencies into experiences and skills that are attractive to civilian employers. To support varying experiences, the credentialing program offers a wide array of credentials, certifications, and licenses to help Soldiers attain their individual and professional goals.

Credential is an umbrella term encompassing programs such as certifications, licensure, and accreditations that attest to an individual's qualification and competence as assessed by a third-party organization. Project management professional and certified facility manager are examples of credentials. *Certifications* represent a recognition of an individual's professional knowledge and experience and help to develop a qualified workforce based on skilled trades, professions, and disciplines. A *license* is a legal requirement for the use of a title and the practice of a discipline. It sets eligibility requirements for an individual to engage in a particular occupation. For example, licensure to become a professional engineer or registered architect is proof that certain standards have been met, usually after the completion of education, experience, and examinations.

When individual training or experience within the military is insufficient to achieve particular civilian credentials, the gaps are filled through education or additional training. In some cases, taking advantage of degree opportunities and furthering education reduces the time necessary to obtain those credentials. Maximum Army funding for examination and licensing fees for a nationally recognized credential, certification, or license is $800 per Soldier in a fiscal year.[4] Depending on the credential, Soldiers may have multiple credentialing opportunities throughout their careers, ending in a refined skill set to ease their eventual civilian transition process.

The Engineer School is developing curricula to incorporate credentialing training programs that will allow leaders and Soldiers to receive a portion of the education and training necessary to meet eligibility requirements for particular credentials. Following graduation from professional military education, credentialing programs will be made available to Soldiers who have completed the Advanced or Senior Leader Courses, the Warrant Officer Basic or Advanced Courses, the Engineer Basic Officer Leader Course, or Engineer Captains Career Course.[5] Together with the U.S. Army Training and Doctrine Command, the Engineer School has

established a pilot program that provides mentorship and points of contact with Soldiers who have completed the requisite training and requirements for selected credentials. The pilot program supports five credentials with initial certifications awarded to cadre, which allow them to mentor graduates from Professional Military Education courses.[6] The Engineer Regiment initiative to reassess additional skill identifiers for enlisted Soldiers and skill identifiers for officers to include more credentials accommodates different engineer skill sets and gives leaders more incentives to obtain particular credentials.

As the push for credentialing opportunities increases, so do the resources available to obtain more information. Table 1 is a consolidated, but not all-inclusive, list of engineering credentials currently being targeted:

Acronym	Credential Name
PE	Professional Engineer
SE	Structural Engineer
RA	Registered Architect
RG	Registered Geologist
PMP	Project Management Professional**
CAPM	Certified Associate in Project Management**
CM	Certified Manager**
CFM	Certified Facility Manager
CCM	Certified Construction Manager**
EMS	Equipment Management Specialist
CEM	Certified Equipment Manager
LEED-GA	Leadership in Energy and Environmental Design–Green Associate
LEED-AP	Leadership in Energy and Environmental Design–Accredited Professional
DAU-FE	Facilities Engineering Certification (Levels I, II, and III)
CDT	Construction Documents Technologist
CCCA	Certified Construction Contract Administrator
CCS	Certified Construction Specifier
CMIT	Construction Manager in Training**
GPC-F	Geospatial Intelligence Professional Certification–Fundamentals
GIS-P	Certified Geographic Information Systems Professional
CP	Certified Planner
ASEP	Associate Systems Engineer Professional
CSEP	Certified Systems Engineer Professional

** Included in the Credentialing Pilot Program

Table 1

Numerous additional resources are available for leaders to obtain more credentialing information and for those seeking civilian credentials or licenses commensurate with MOS skills and management experience acquired during their military service. Below are some helpful links and resources:

- Army education counselors: Provide further information about credentialing opportunities and funding options.
- Army Directive 2015-12: Provides implementation guidelines and eligibility requirements for the Army Credentialing Program.

  For more information, see the Web site at <http://armypubs.army.mil/epubs/pdf /ad2015_12.pdf>.
- COOL (Credentialing Opportunities Online): Provides a vast menu of credentials in many fields and MOSs and the corresponding requirements of each credential.

  For more information, see the Web site at <https://www.cool.army.mil/>.
- Engineer Regiment Credentialing Program Handbook: Lists requirements for various credentials, certifications, and licenses.

  For more information, see the Web site at <https://mil-suite.mil/book/groups/engineer-credentialing-forum/>
- Society of American Military Engineers (SAME): Provides military engineers with information about the most commonly recognized credentials in the architecture, engineering, and construction industries.

  For more information, see the Web site at <http://www.same.org/index.php/component/content/article/1040>.

  SAME also sponsors a Credentialing Achievement Awards Program for young members and noncommissioned officers.

  For more information, see the Web site at <http://www.same.org/index.php/events/credentialing-achievement-awards-program>.

As the Army Credentialing Program continues to develop, articles featuring credentials, certifications, and licenses will be included in future editions of *Engineer*.

Endnotes:

[1]Michelle Tan, "Army to Create Certifications or Licenses for Every MOS," *Army Times*, 24 March 2015, <http://www.armytimes.com/story/military/careers/army/enlisted/2015/03/23/army-credentialing-every-os/25049105/>, accessed on 8 December 2015.

[2]Army Directive 2015-12, "Implementation Guidance for Credentialing Program and Career Skills Program," John McHugh, Secretary of the Army, <http://armypubs.army.mil/epubs/pdf/ad2015_12.pdf>, accessed on 19 November 2015.

[3]*Engineer Regiment Credentialing Program Handbook*, Directorate of Training and Leader Development, Fort Leonard Wood, Missouri, <https://www.milsuite.mil/book/groups/engineer-credentialing-forum/overview>, accessed on 19 November 2015.

[4]Army Directive 2015-12.

[5]*Engineer Regiment Credentialing Program Handbook*.

[6]Ibid.

Captain Huffmyer is a student in the Engineer Captains Career Course. She holds a bachelor's degree in business administration from Colorado State University.

This is one in a series of articles concerning engineering support to the European Reassurance Initiative (ERI). It details the challenges faced in managing the construction efforts of engineer enablers and examines the engineer resource planning process. For other articles in the series, see Engineer*, September–December 2015.*

STRONG EUROPE, STRONG ENGINEER ENABLERS

By Major Kenneth R. Jones and Captain Christopher R. Elam

The past 20 months can best be described as a challenge to make Europe more reliable and ready for conflict. The sense of urgency has been fueled by unforeseen aggression, limited initial capabilities, and an ever-expanding North Atlantic Treaty Organization (NATO) footprint. Operation Atlantic Resolve (AR) is an ongoing U.S. effort to provide assurance to our European allies by augmenting their forces and conducting exercises with NATO allies.

Throughout the fall and early winter of 2014, engineer planning focused on courses of action to accomplish what was becoming a monumental undertaking. How engineers have played their part in making Europe stronger can best be illustrated by examining mission requirements, analyzing available forces, and exploiting innovative solutions. The process that engineer planners used to conduct high-level resource planning for this type of operation within a complex, nontraditional environment, compressed timeline, and ever-increasing sense of urgency can be broken down into the following basic steps:

- Analyze requirements.
- Analyze available resources.
- Request resource shortfalls from higher headquarters.
- Draft an initial task organization.
- Assign mission command elements (MCEs) and command and support relationships, requesting any additional necessary MCEs.
- Monitor and reevaluate the task organization through the rest of the planning and execution processes.

Analyze Requirements

Engineers were given the task of planning, developing, and improving training support areas to demonstrate U.S. resolve and commitment to its NATO allies. To plan resources for ERI troop construction, engineer planners had to understand the requirements. Initial planning for AR and ERI divided Europe into AR-North and AR-South. AR was the set of exercises conducted; ERI was the funding package that supported them. During a series of technical engineering surveys, the team divided construction requirements at each site into those that fell within troop construction capabilities and those that would have to be accomplished by contract. The focus of this article is on planning for troop construction. The end result was an initial requirement estimate of one construction engineer battalion in AR-North and another in AR-South. As engineer planners refined the estimate, the final requirement to support fiscal year (FY) 2015 troop construction was three construction companies and an engineer brigade (-).



A Romanian soldier and his U.S. counterpart survey a future road project.



A U.S. combat engineer helps Romanian soldiers lace their cratering charges with white tape to mark where they will be buried at the Cincu Training Center.

Analyze Available Resources

The second step in resource planning is to determine which resources are available to the organization. During the rapid execution of ERI planning, the analysis of available forces identified the 15th Engineer Battalion as the only organic construction battalion in U.S. Army Europe (USAREUR). The battalion includes one horizontal (earth-moving) and one vertical (structural) company. The critical detail revealed during the analysis was that the battalion supports U.S. European Command and U.S. Africa Command. In late November and early December 2014, a platoon from the 15th Engineers deployed to support U.S. Africa Command Operation United Assistance, complicating USAREUR engineer plans to employ assigned construction capability to support AR. Fortunately, further analysis allowed engineer planners to reduce the requirement for an entire battalion in both AR-North and AR-South so that the 15th Engineer Battalion could support AR and Operation United Assistance. However, this challenge emphasized the importance of establishing ERI as a priority for the 15th Engineer Battalion to ensure the long-term success of AR.

Request Resource Shortfalls from Higher Headquarters

Once requirements were understood and planners had allocated the needed engineer capabilities, it was time to determine what additional engineer assets were required. When requesting additional resources, only a thorough analysis of requirements and capabilities can provide justification to higher headquarters. Since the 15th Engineer Battalion is the only assigned Army construction battalion in Europe, engineer planners understood that there was an engineer deficit that would require assistance from outside USAREUR.

Based on the compressed timeline and approval process, engineer planners submitted an initial request for engineer forces by mid-December 2014. This request included an additional engineer construction battalion and a deployable command post from a theater engineer command. However, there were difficulties with sourcing the request for forces because AR was not a named operation. Therefore, the proper mobilization and funding authorities to employ Regular Army or Reserve Component engineers did not exist. As a result, engineer planners cancelled the request for forces and began exploring more innovative ways to achieve engineer effects in support of AR. The result was to leverage the National Guard through the U.S. European Command-sponsored State Partnership Program (SPP). USAREUR engineer planners identified an engineer brigade headquarters and two company size construction units. These elements and a company from the 15th Engineer Battalion fulfilled the ERI troop construction requirement for FY 15.

Draft an Initial Task Organization

Task organization is key to the success of all military operations. The AR troop construction mission was no different. Engineer planners developed an initial task organization for the mission, but it was complicated by a lack of familiarity between the Regular Army and National Guard units that were to execute the construction. Task organization ensures that the right amount of equipment and personnel are available to successfully accomplish an assigned mission. If done correctly, task organization is the focal discussion point throughout the planning process, allowing planners to assess, validate, and refine required assets based on mission requirements. Without a task organization, planning becomes extremely difficult. One of the common mistakes planners make is believing that they can develop the plan first and then shape the task organization based on the plan. The correct way to develop a plan is to develop a task organization based on an understanding of the mission and then revisit that task organization throughout the military decisionmaking process, based on changing requirements and additional guidance.

Unfortunately, the task organization for FY 15 troop construction was less than optimal because of the requirement to begin execution before fully understanding the complexities of the mission. As a result, the importance of a well-defined task organization was highlighted during the after action review. Due to this emphasis, task organization became the first task and deliberate planning objective for FY 16 troop construction planning.

Assign MCEs and Command and Support Relationships

Part of developing a task organization is assigning MCEs, including initial command and support relationships. This allows units to understand their roles and responsibilities. (This deliberate assigning of

command and support relationships often reveals a shortfall in MCEs.) For AR, USAREUR worked with the Department of the Army to resource a division tactical MCE. For the Office of the Deputy Chief of Staff, Engineer (ODCSENG), a division tactical headquarters (in this case, 4th Infantry Division headquarters) would not provide the full complement of engineer expertise needed to take the place of a theater engineer command, especially with respect to construction. However, the 4th Infantry Division engineers could relieve some of the tactical oversight of engineer missions that a corps, division, or brigade engineer headquarters would normally provide. Before the arrival of the 4th Infantry MCE, tactical oversight of engineer missions resided with ODCSENG. It wasn't a perfect solution, but it freed ODCSENG to provide the technical engineering expertise, strategic planning, and scoping of projects.



Heavy equipment from the 877th Engineer Battalion and the Romanian Land Forces work in unison at the Cincu Training Center.

Monitor and Reevaluate the Task Organization

As the planning of an operation progresses, the resources required may change drastically. When a change in the plan requires a modification to the task organization, the resourcing team needs to continually ensure that new requests are made to address resource shortfalls and that command and support relationships remain effective. To capture and communicate the engineer planning effort in support of AR, the plans section of ODCSENG developed a scheme of engineer operations that outlined the main and supporting efforts for the six AR countries. This document became the primary vehicle that the engineers used to illustrate how engineer effects in supporting AR would be achieved throughout the year. The 194th Engineer Brigade, Tennessee Army National Guard, and the 877th Engineer Battalion, Alabama Army National Guard, are active participants in the SPP. The 194th is partnered with Bulgaria, and the 877th is partnered with Romania. ODCSENG explored employing SPP elements early to meet ERI project requirements, but the complexity associated with using SPP elements required a USAREUR commitment. This meant that all of the support relationships had to be established before SPP was confirmed. In January 2015, USAREUR funded the transportation of equipment and personnel from both states. Once USAREUR committed to SPP, ODCSENG had to adjust the task organization and the command and support relationships to accommodate these new resources.

Resource planning is a constantly shifting battlefield that requires adaptable thinkers who are capable of applying tested techniques and analyses to nontraditional, ambiguous situations. Developing solid justifications for resources is critical for success, and building on that success in successive iterations leads to excellence.

Lessons Learned

As this article is being written, ODCSENG is on pace to execute all FY 15 ERI commitments in support of AR, and planning for FY 16 stands on the solid ground of experience. FY 15 planning and execution have highlighted the value of a tactical-level engineer MCE, clearly articulating roles and responsibilities between the Army service component command and MCE engineers, following logical analyses in determining requirements, and requesting resources as early as possible.

Another lesson that became painfully obvious throughout the FY 15 construction season involved the importance of habitual relationships. When the 4th Infantry Division became the division tactical headquarters for AR, USAREUR was already executing projects and running exercises. USAREUR and the division were forced to develop roles and responsibilities during these events, and the lack of a long-standing, habitual relationship complicated this process. The only effective way to overcome this challenge is to publish clearly defined command and support relationships, roles, and responsibilities and to constantly reinforce them until they become ingrained. This lesson learned is most important because it highlights the critical importance of constantly training with our NATO allies. Establishing hasty relationships was a challenge with two units from the same country and branch of service and is exponentially harder when working through language barriers and differing equipment. Without consistent presence and partnering, interoperability is effectively nonexistent. If interoperability is to be the strength of NATO, constant training is the only method of achieving effective deterrence in Europe.

Major Jones serves as chief of plans in the Office of the Deputy Chief of Staff, Engineers, USAREUR. He is a graduate of the U.S. Air Force Air Command and Staff College, the Engineer Captains Career Course, and the Bradley Leaders Course. He holds a Master of Military Operational Art and Science degree from the U.S. Air Force Air University.

Captain Elam serves as the supply officer for the 15th Engineer Battalion at Grafenwoehr, Germany. He holds a bachelor's degree in civil engineering from the U.S. Military Academy–West Point, New York, and a master's degree in engineering management from Missouri University of Science and Technology at Rolla. He is a licensed professional engineer in Missouri.

This is one in a series of articles concerning engineering support to the European Reassurance Initiative (ERI). It details the closer interoperability of U.S. Army Europe (USAREUR) with the North Atlantic Treaty Organization (NATO), which has been achieved with the recent increase in activities due to ERI. For other articles in the series, see Engineer, *September-December 2015.*

Strong Europe: Stronger Through NATO

By Mr. Joseph Copeland

Whether bouncing around in the back of an all-terrain truck full of Polish armor officers at the Drawsko Pamorskie Training Area in Poland or laying out surface danger zones side by side with Bulgarian Army officers in the frigid winter winds at the Novo Selo Training Area, USAREUR engineers are working ardently today to build more interoperability with NATO allies across a broad spectrum of engineer operations in the European Theater. While USAREUR has been active in these two former Warsaw Pact nations since their accession into NATO, recent activities promote new relationships that are being forged following regional tensions with Russia and enduring alliances that are being invigorated with a new sense of purpose.

When President Barack Obama announced during a trip to Poland in 2014 that the United States would spend $1 billion for ERI, many skeptics across the world viewed these initiatives as the revival of a Cold War relic, but this couldn't be further from reality. President Obama was reaffirming the U.S. commitment to supporting a stable, secure Europe, of which NATO is a critical cornerstone. Anyone working in the 51-country U.S. European Command area of operations in the last decade understands how closely U.S. forces work with their NATO allies. But some observers still believe that NATO is obsolete.

U.S. European Command is deeply invested in operating with America's NATO allies, with USAREUR being particularly active recently. Articles on the USAREUR Web site describe military engagements spanning 28 NATO countries, including the United Kingdom, Canada, Romania, Latvia, Estonia, Germany, Italy, and others. In 2010 alone, the U.S. military actively carried out, or participated in, 33 major multinational training exercises with participation by 50,000 troops from 40 European countries. With hundreds of engagements and exercises conducted in 2015 and more planned for 2016, USAREUR continues to actively engage at all levels with NATO partners. Despite possible perceptions to the contrary, NATO and the United States have been deeply engaged in developing and maintaining strategic, operational, and even tactical interoperability.

Representatives from U.S. Air Force Europe frequently work closely with NATO counterparts on complex airfield challenges. In 2010, an airfield survey aimed to reduce dangerous airborne debris at Albacete Air Base, Spain, in support of the 10 NATO countries training F-16 fighter pilots in the Tactical Leadership Program. When the U.S. Air Force F-16 squadron at Spangdahlem Air Base in Germany participated in theater security cooperation events with its Polish sister squadron at Lask Air Base in Poland in 2011, an American airfield pavement engineer subject matter expert coordinated a friction evaluation of the Lask runway to ensure pilot safety during wet-weather operations. Today, that same Lask Air Base runway hosts Poland's national air exercise Eagle Talon, which involves U.S., French, British, and other NATO aircraft.



An Estonian liaison officer consults with a U.S. Army engineer about potential joint engineer construction projects at Tapa, Estonia.

U.S. Air Force representatives on a NATO airfield pavement team made up of pavement subject matter experts from many nations met semiannually for years to initiate, edit, and revise NATO standardization agreements related to airfield pavement infrastructure. So even before current tensions with Russia, the Air Force was heavily engaged with NATO allies and it continues to cooperate with NATO militaries. So why does the perception still persist that the United States is in a "rebuilding phase" with NATO relationships across Europe?



USAREUR engineers work with representatives from the Polish Ministry of National Defence.

This perception may be due to a shrinking defense budget that has prompted reductions in the U.S. military installation footprint in Europe, with subsequent reductions in military and civilian personnel overseas. The USAREUR Office of Deputy Chief of Staff, Engineer (ODCSENG) once had an entire branch consisting of 12 military and civilian engineers supporting NATO efforts in areas such as missile air defense sites, forward storage sites, emergency water crossings, special weapons, and an ammunition program, among others. After the Soviet Union fell, these NATO positions were either deemed obsolete and refocused or were lost in reductions. These changes might lead to the conclusion that U.S. Army engineers have lost touch with NATO, but that is not true. Just as the rest of the U.S. military has learned to embrace the mantra of "do more with less," the USAREUR staff, specifically ODCSENG, has absorbed the tasks required for NATO interoperability and incorporated them across the staff to the point where they are married with everyday tasks. These changes have actually led to more NATO interoperability, not less.

As the U.S. and European economies have shrunk over the last 13 years and wars in Iraq and Afghanistan have taken their toll, U.S. focus shifted to the divestiture and consolidation of main operating bases across central and western Europe, with subsequent strategic positioning of forward operating sites in eastern Europe. Once again, the cutbacks have not adversely affected support to NATO interoperability. At ODCSENG, daily management of U.S. sites in NATO countries such as Turkey, Bulgaria, and Romania ensures that engagement with NATO counterparts continues to build upon strong relationships that have developed over the past several years. ODCSENG will continue to engage with its military engineer counterparts on a daily basis to further develop interoperability by executing infrastructure projects that support joint training and exercises with the NATO nations initially impacted by ERI—Estonia, Latvia, Lithuania, Poland, Bulgaria, and Romania.

However, a number of exciting challenges are beginning to take shape as NATO transitions from the International Security Assistance Force mission in Afghanistan to the mission of ensuring the security of the European theater. In some instances, old security plans are being revived and updated, while other plans are being newly developed. An example of a new plan is the Readiness Action Plan, which is the NATO response to changes in the security environment, particularly on the eastern and southern periphery of its territory. The Readiness Action Plan is characterized by two overarching goals: 1) to assure NATO member populations and deter potential aggression through increased military activity; and 2) to adapt the long-term capabilities and military posture of the alliance.

NATO Secretary General Jens Stoltenberg said in November 2014 that "The Readiness Action Plan is the biggest reinforcement of our collective defense since the end of the Cold War."[1]

U.S. Army engineers at ODCSENG are working with their NATO counterparts to identify logistic, host nation support, and engineer needs being generated by the Readiness Action Plan to proactively execute these critical supporting requirements.

Whether jointly executing numerous technical engineer surveys with NATO partners to identify ERI project requirements; attending a NATO host nation support workshop in Krakow, Poland; or providing engineer support for tank shipments into Bulgaria, ODCSENG and USAREUR continue to actively engage in NATO assurance and deterrence measures in the European theater. We remain committed to our NATO allies because we embrace one enduring tenet: the United States is stronger with Europe, and Europe is stronger through NATO.

Endnote:

[1]Atlantic Council, "NATO Releases Details of its New Readiness Action Plan," 2 December 2014, <http://www.atlanticcouncil.org/blogs/natosource/nato-releases-details-of-its-new-readiness-action-plan>, accessed on 16 December 2015.

Mr. Copeland is the chief of the Technical Engineer Division for ODCSENG, USAREUR. He holds a bachelor's degree in civil engineering from the University of Oklahoma and a master's degree in engineering management from Oklahoma State University. He is a licensed professional engineer in North Carolina.



The Engineer Training Support Battalion:
Training Our Regiment

By Lieutenant Colonel Gerald S. Law

Soldiers from the Army National Guard and U.S. Army Reserve comprise 80 percent of the Engineer Regiment, so Army engineers must understand how these forces are trained and assessed. First Army engineer training support battalions and their combined arms training brigades train and assess Reserve Component (RC) units across the country according to First Army priorities and critical lines of effort (LOEs). This article describes the mission, priorities, and LOEs of engineer training support battalions and presents the major implications for the Engineer Regiment.

The 1st Engineer Battalion, 345th Infantry Regiment, located at Camp Atterbury, Indiana, trains RC units from Indiana, Illinois, Iowa, Ohio, Minnesota, Wisconsin, and Missouri. The 1st Engineer Battalion, part of the 157th Infantry Brigade and First Army Division East, consists of 55 to 60 senior Soldiers who partner with RC units to advise, assist, and train them to achieve directed readiness requirements before and after mobilization to support the sustainable readiness model. The battalion also provides training to joint, combined, interagency, and Regular Army forces.

First Army focuses on two priorities—readiness and transformation.[1] To support those priorities, 1st Engineer Battalion concentrates on three LOEs, which include—

- ***Establish engaged, habitual partnerships.*** These partnerships require more than simply providing oversight to RC units. They must build trust between First Army units and RC forces. Therefore, the Soldiers of



A 1st Engineer Battalion OCT observes the objective rally point actions of a unit conducting dismounted platoon improvised explosive device clearance during an exercise.

1st Engineer Battalion work to become team members with their partnered units by standing shoulder to shoulder to advise and assist in training management, exercise design, doctrinal education, and mission command.

For example, members of the battalion attend weekend battle assemblies and annual training events to help RC units develop, assess, and achieve their yearly training objectives. Recently, the battalion partnered with the 37th Infantry Brigade Special Troops Battalion to provide effective observer-controller trainer (OCT) support during an exportable combat training capability exercise at Camp Grayling, Michigan. By the end of the exercise, the 1st Engineer Battalion had increased the 37th Infantry Brigade Special Troops Battalion unit readiness by improving its tactical proficiency and ability to conduct training management and mission command.

- ***Enable RC commanders.*** Despite the numerous challenges that RC forces face, commanders must mobilize their units for deployments. Since First Army leaders believe that "their success is our success," 1st Engineer Battalion OCTs help RC commanders assess and train their units. Developing habitual relationships with Army National Guard and Army Reserve units allows the OCTs to provide relevant and accurate feedback to commanders. For example, they assess the number of days each unit would need at a mobilization station. Since a First Army goal is to minimize the time required at mobilization stations, feedback enables the RC commanders, which also ensures unit readiness.
- ***Develop leaders.*** Leader development is at the heart of the First Army LOEs. Leaders achieve results, facilitate change, build readiness, develop engaged partnerships, and enable RC commanders. The 1st Engineer Battalion ensures that its personnel are trained and ready to achieve First Army priorities through institutional development, operational development, and self development.

For example, 1st Engineer Battalion personnel are required to complete schooling, courses, and other training opportunities to support OCT certification, which facilitates leader development. OCTs also attend rotations at the National Training Center, Fort Irwin, California; the Joint Readiness Training Center, Fort Polk, Louisiana; and exportable combat training centers to promote certification.

Finally, 1st Engineer Battalion OCTs must explain their qualifications before assuming duties with First Army. OCT certification is not obtained by attending classes alone. OCTs must demonstrate their proficiency through demonstrations and verbal and written tests. Commanders have many priorities, but none are achievable without leaders. Therefore, the 1st Engineer Battalion works to develop mentally agile leaders who are critical thinkers capable of achieving results.

First Army priorities and LOEs have many implications for the Engineer Regiment. Since 80 percent of the Engineer Regiment consists of RC units, First Army priorities and LOEs affect most of the engineer force. Although training evaluation and assessment standards are identical for RC and Regular Army forces, RC forces have only 39 days per year to achieve those standards. Therefore, establishing engaged, habitual partnerships between First Army and the Engineer Regiment is necessary to develop and meet RC training goals. Finally, the Army is reducing its forces



An OCT observes a platoon level breach at Camp Grayling, Michigan.

and must rely on Army National Guard and Army Reserve forces to accomplish national security goals.[2] Therefore, by concentrating on RC premobilization training, First Army units work to reduce RC postmobilization training time. Developing partnerships with RC engineer units will minimize postmobilization time and resources.

Establishing habitual partnerships, enabling RC commanders, and developing leaders are critical tasks for First Army and RC success. The 1st Engineer Battalion works continuously to help RC commanders with unit training management, exercise design, doctrinal education, and mission command, thereby increasing their unit readiness. The First Army team and its engineer training support battalions play a vital role in assessing and increasing readiness for most of the Engineer Regiment.

An assignment in First Army is professionally rewarding. Engineers who join the First Army team help prepare RC Soldiers, leaders, commanders, and units across the United States for the wide range of contingency expeditionary-force missions facing the Army. Members of the First Army team can grow professionally as Army leaders while working to make good units great by providing expertise and experience through coaching, teaching, and mentoring. Soldiers interested in joining First Army or obtaining additional information on becoming an OCT should see their U.S. Army Human Resources Command manager, e-mail First Army at <usarmy.ria.1-army.mbx.first-army-hq-pao@mail.mil>, or visit <www.first.army.mil>.

Endnotes:

[1]"Command Training Guidance for Fiscal Year 2016," First Army memorandum, Rock Island Arsenal, Illinois, 15 July 2015.

[2]"Stand-To! The Official Focus of the U.S. Army," *Army Total Force Policy—Reserve Component Training Integration*, 21 May 2014, <http://www.army.mil/standto/archive_2014-05-21/>, accessed on 25 February 2016.

Lieutenant Colonel Law is the commander of 1st Engineer Battalion, 345th Infantry Regiment, 157th Infantry Brigade, Camp Atterbury. He is a graduate of the U.S. Army Combined Arms Services Staff School and the U.S. Army Command and General Staff College. He holds a bachelor's degree in industrial engineering from Utah State University; a master's degree in geology and geophysics from the University of Missouri–Rolla (now Missouri University of Science and Technology); a master's degree in military arts and science from the U.S. Army Command and General Staff College; and a master's degree in adult, occupational, and continuing education from Kansas State University.

Photos by Lieutenant Colonel Gerald S. Law.

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Articles should be concise, straightforward, and in the active voice. Avoid using acronyms when possible. When used, acronyms must be spelled out and identified at the first use. Avoid the use of bureaucratic jargon and military buzzwords. Text length should not exceed 2,000 words (about eight double-spaced pages).

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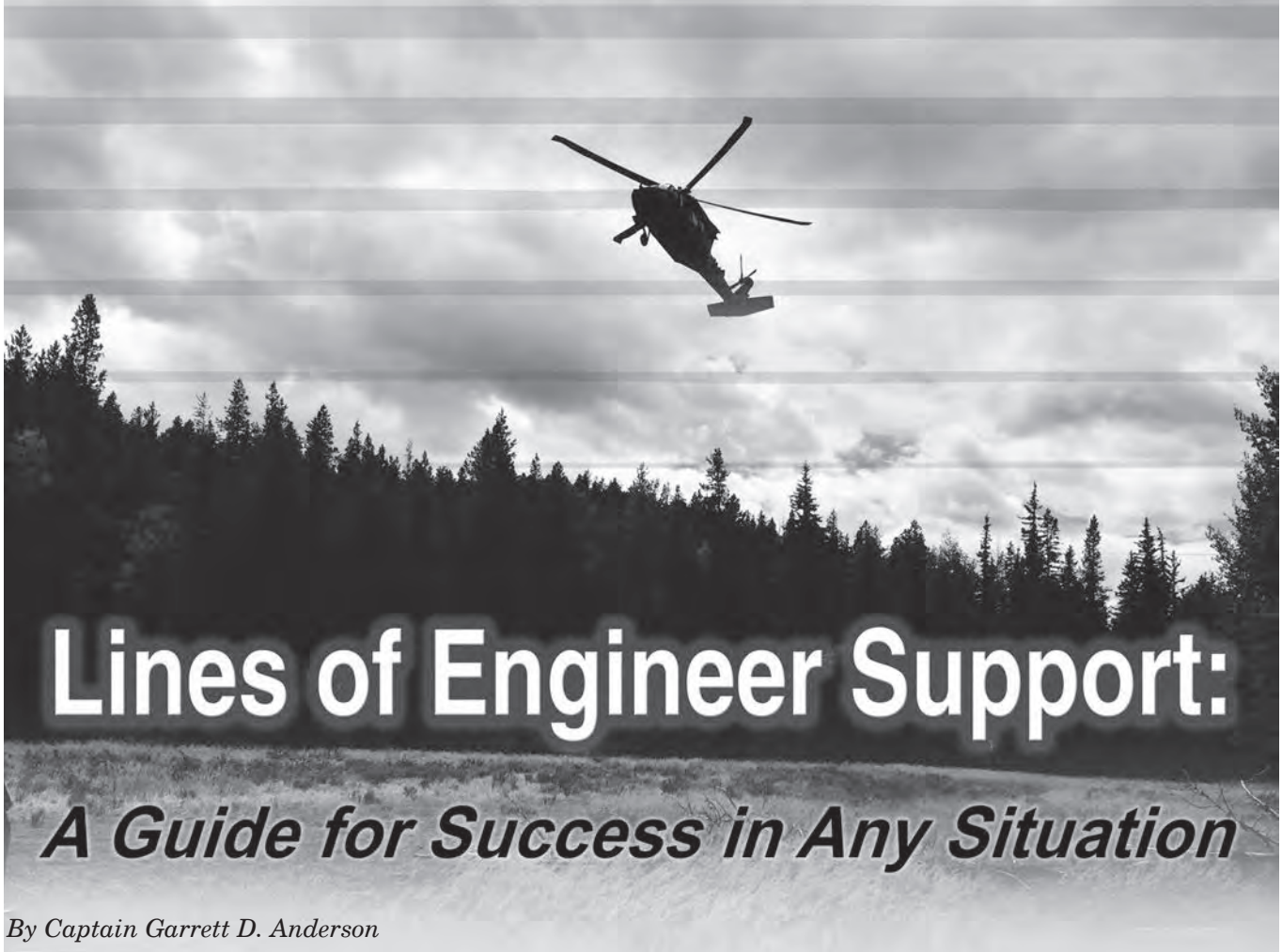
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Lines of Engineer Support:

A Guide for Success in Any Situation

By Captain Garrett D. Anderson

Downed-aircraft recovery is an aviation term used to describe a specific mission performed by the aviation community in the unfortunate event of a downed aircraft. Typically, an engineer would not discuss such a misfortune and such a mission with the engineer community. However, as the commander of Headquarters Support Company, 404th Aviation Support Battalion, I provided recommendations and advice to the battalion commander based on the four lines of engineer support. Field Manual 3-34, *Engineer Operations*,[1] explains how (not what) to think about exploiting the capabilities of the Engineer Regiment in support of military operations. It describes how engineers combine the skills and organizations of the three interrelated engineer disciplines (combat, general, and geospatial engineering) to provide support that helps ground force commanders—

- Assure mobility.
- Enhance protection.
- Enable force projection and logistics.
- Build partner capacity and develop infrastructure among populations and nations.

Field Manual 3-34 states that the Engineer Regiment exists to provide freedom of action for land power by mitigating the effects of terrain.[2] This article highlights how my company incorporated the engineer mission and integrated the lines of engineer support and how the lines of support were used during the downed-aircraft recovery team mission at Fort Carson, Colorado.

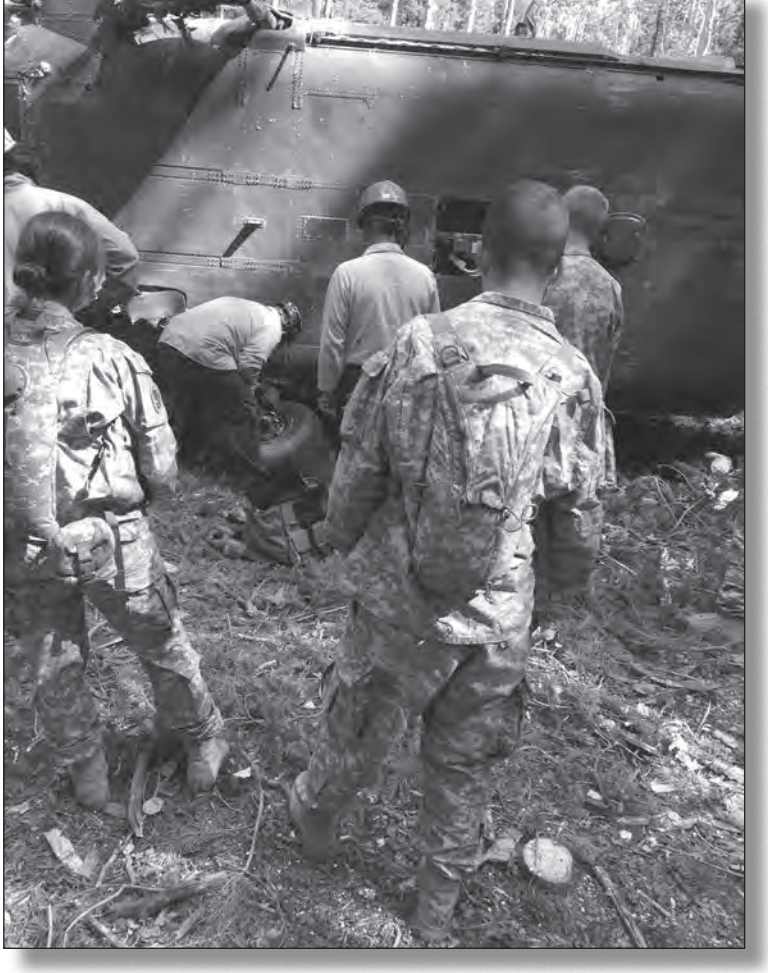
The security of the downed aircraft was the top priority during the operation. We used the framework of two of the four lines of engineer support—assure mobility and enhance protection—during this phase of the operation. The first step



Soldiers remove crash debris to allow supplies to be dropped in at the site.

was to conduct terrain analysis of the area and provide the battalion with intelligence about the routes to the crash site from a helicopter landing zone located roughly a mile away from the site through densely forested terrain with elevations reaching more than 9,000 feet. Headquarters Support Company supplied the battalion with graphics to illustrate the dense terrain and provide the commander with a visual sense of the area of operations from which the aircraft would be recovered.

In navigating to the crash site from the helicopter landing zone, we found easier routes that would be more conducive to the transportation of food and water to the security force to be stationed near the downed aircraft. Once on the ground, we facilitated the security of the aircraft. In an overwatch position, we used the terrain to our advantage to safely intercept any passersby. Working with firefighters and representatives from the U.S. Forest Service and the U.S. Department of the Interior Bureau of Land Management, we established a hasty drop site. This required preventing fuel contamination of the site and downing some trees that kept recovery workers from sling loading the wreckage. The clearing of the trees also enabled the battalion to drop firefighting tools and maintenance recovery items directly on the site instead of transporting them across rough terrain with limited personnel. Referencing two lines of engineer support, we were able to enhance protection and ensure the mobility of the aircraft.



Soldiers and firefighters work together to right the aircraft.

Establishing an integration cell at the landing zone was the secondary priority for Headquarters Support Company. Although this was no base camp, aerial port of debarkation, or surface port of debarkation, the landing zone served a similar purpose. All personnel passed through the integration cell at the landing zone for accountability before continuing to the security site and when returning from the site for the flight out. The integration cell also maintained communications and served as a hub for resupply of food, water, and medical supplies. Sleeping quarters accommodated up to 15 Soldiers, with sustainment for 72 hours to mitigate possible danger from the ever-changing Colorado weather. The site was manned 24/7 throughout the operation to provide a secondary mission command node and to enable the operations cell at the battalion headquarters to monitor the operation with little interference in daily operations. This task can be directly linked to the line of engineer support of enabling force projection and expeditionary logistics.

The restoration of the forest floor was a top priority for the two federal agencies in the task force, and it is directly linked to the line of engineer support of building partner capacity and developing infrastructure among populations and nations. Working hand in hand with firefighters and representatives from the Forest Service and the Bureau of Land Management, the battalion ensured that the site was left in a state that protected the forest from natural hazards such as floods and fires. The battalion efforts helped return the forest to its natural state at an accelerated rate. This would not have been possible without the partnership that the battalion had formed with the other entities. The coordination and capacity of the battalion to work as a liaison was key to the success and closure of the operation.

Throughout the downed-aircraft recovery team operation, Headquarters Support Company and 404th Aviation Battalion used the lines of engineer support, highlighted the engineer mission, and showed that an operation doesn't have to be an engineer-centric ground mission for the lines of engineer support to serve as a guide for success. During this operation, engineers ensured mobility by providing routes from the landing site to the security site; established security and enhanced the protection of the aircraft; enabled expeditionary logistics with a site integration setup; and built partner capacity by working with federal, state, and local entities to reconstruct the forest floor.

Endnotes:

[1]Field Manual 3-34, *Engineer Operations*, 2 April 2014.

[2]Ibid.

Captain Anderson is a graduate of the Engineer Officer Basic Leader and Captains Career Courses. He holds a bachelor of science degree from Fayetteville State University, Fayetteville, North Carolina; and a master of public administration degree from Webster University, St. Louis, Missouri. He is the commander of Headquarters Support Company, 404th Aviation Support Battalion, Fort Carson.



Integrating Allied Engineers Into a Brigade Engineer Battalion

By Captain Jeffrey R. Rickard

According to Army Regulation 34-1, *Multinational Force Interoperability*, "The changing security environment presents a complex range of threats, challenges, and opportunities, making it likely that U.S. forces will be called on to operate under a broad variety of conditions and with many foreign partners. U.S. forces will mitigate risks through better force management and increased military-to-military interoperability with allies and foreign partners."[1] Within this context, U.S. Army leaders in an era of military downsizing must be prepared to integrate allied units into their formations to ensure the future success of U.S. and North Atlantic Treaty Organization (NATO) operations. The Joint Multinational Readiness Center (JMRC) in Hohenfels, Germany, is the primary training and proving ground to achieve multinational integration and interoperability. This article describes the following challenges and associated lessons learned in integrating allied engineer units into a U.S.-led multinational brigade:

- Understanding of allied engineer capabilities and limitations.
- Familiarity with NATO Standardization Agreements (STANAGS) and allied engineer doctrine.
- Consideration of national land mine policies and caveats.
- Establishment of effective communications.

Understanding of allied engineer capabilities and limitations. To properly integrate allied engineers into a U.S.-led multinational brigade, it is essential that the brigade engineer battalion (BEB) commander, staff, and assistant brigade engineer understand allied engineer capabilities and limitations. The best way to acquire that understanding is by conducting bilateral capabilities



A Moldovan soldier provides explosive ordnance disposal support to a U.S. engineer platoon.

briefings. Not only should the subordinate attached elements brief their capabilities, but the receiving headquarters should also define its capabilities and clarify the limitations and restrictions of command and support relationships.

In addition to the opportunity to build trust with, and rapport within, the multinational unit, the understanding gained from a detailed capabilities brief provides the commander and staff with the information needed to leverage capabilities, develop tasks and purposes, and determine effective task organization structures. A failure to identify capabilities and limitations has resulted in a lack of integration, coordination, and synchronization at multiple levels within multinational brigades while training at JMRC.



Romanian and U.S. engineers emplace wire obstacles.

During Exercise Combined Resolve IV at JMRC in May and June 2015, a U.S. Army BEB received Romanian and Danish engineer platoons. Looking at the task organization, it might seem that the BEB gained additional engineer assets to complete its mission of providing mobility, countermobility, and survivability support to the brigade. However, the reality was more complex than that. For example, the Romanian engineer platoon was depicted in the exercise task organization as a motorized engineer platoon. To a BEB commander and his staff, that might imply that the attached unit is capable of emplacing or reducing obstacles and performing other tasks similar to those that a U.S. Army engineer platoon could accomplish. However, the Romanian engineer platoon leader described unit capabilities and tactics, techniques, and procedures differently in the capabilities briefing to the BEB commander and his staff before the start of the exercise. In reality, the platoon was an engineer reconnaissance element capable of conducting forward reconnaissance of enemy obstacles, but with limited mobility, countermobility, and survivability assets.



Romanian and U.S. engineer platoon leaders discuss the emplacement of an obstacle group.

On the other hand, the attached Danish engineer platoon brought capabilities that a BEB commander would expect from a U.S. engineer platoon. The Danish platoon consisted of two armored engineer squads, an armored recovery squad, and a horizontal construction section. During his capabilities brief, the Danish platoon leader explained his unit's mobility, countermobility, and survivability tactics, techniques, and procedures while highlighting the unique capabilities it could provide from its armored mine-clearing vehicle, armored engineer vehicle, and armored bridge layer.

With the information gained from the capabilities brief, the BEB commander, staff, and assistant brigade engineer were more prepared to conduct analyses and make informed decisions on how best to leverage their allied engineer attachment capabilities, underwrite attachment limitations, and properly integrate the attachments into the maneuver plan.

Familiarity with NATO STANAGS and allied engineer doctrine. One of the recurring lessons learned from observing several multinational brigades training at JMRC is that BEB commanders and their staffs must be familiar with NATO STANAGs and the engineer doctrine of the attached unit to integrate, coordinate, and synchronize operations more effectively.



A Danish engineer armored vehicle prepares fascine to reduce a dry gap.

In particular, familiarity with, and adherence to, NATO STANAG 2036, *Land Mine Laying, Marking, Recording and Reports Procedures,*[2] and STANAG 2989, *Transfer of Barriers*,[3] are required to create a common operating picture within the multinational brigade. Many U.S. and allied engineer units that train at JMRC default to using their own tactical standard operating procedures due to an unfamiliarity with NATO STANAGs. That lack of knowledge, observed over multiple training rotations, has resulted in confusion between U.S. and allied units. More importantly, the failure to use NATO STANAG reporting procedures results in an unclear common operating picture and is a contributing factor to fratricidal incidents.

If NATO STANAGS are not used, the U.S.-led multinational brigade standards for obstacle handover and turnover and land mine laying, marking, recording and reporting must be clearly communicated to, and understood by, all elements within the multinational brigade before operations commence. This facilitates a common operating picture and a common understanding across the brigade leadership that helps prevent confusion and possible fratricide.



A Romanian engineer platoon leader conducts a capabilities briefing to a U.S. BEB commander and staff.

In addition to a familiarity with NATO STANAGs, a baseline knowledge of attached allied engineer doctrine and tactics, techniques, and procedures contributes significantly to proper integration. For instance, understanding how an attached allied engineer element will reduce one vehicle lane through a tactical obstacle is important when considering how it will affect the tempo of the maneuver assault force. Many of the allied engineer units that train at JMRC conduct extremely deliberate reductions that take much more time than a deliberate or hasty breach conducted by U.S. engineers. Additionally, according to Field Manual 3-16, *The Army in Multinational Operations*, "while U.S. brigade combat team commanders are accustomed to the decentralized integration of engineer operations at the tactical level, former Warsaw Pact nations have traditionally employed engineer assets in a much more centralized manner at the division and corps level. As a result, tactical commanders develop engineering tasks associated with building integrated obstacles and mutually supporting engagement areas at the battalion and brigade level. An understanding of these tasks and other differing doctrinal traditions manage expectations and result in greater integration of multinational forces."[4]

Consideration of national land mine policies and caveats. Each nation represented within a multinational brigade has its own national policy and caveats regarding land mines. Therefore, it is imperative for U.S. commanders to understand those policies and caveats to properly integrate the allied elements into their formations.

For example, many NATO allies are signatories of the Convention on the Prohibition of the Use, Stockpiling, Production, and Transfer of Anti-Personnel Mines and on their Destruction (the Ottawa Mine Ban Treaty) and have agreed not to use antipersonnel land mines.[5] However, some of those nations still authorize the employment of persistent antitank mines in accordance with their national caveats. Although not a signatory to the convention, the U.S. government announced on 23 September 2014 that the United States will

not use antipersonnel land mines outside the Korean peninsula and is taking steps to end the use of all undetectable mines and persistent mines.[6] U.S. commanders must consider whether their subordinate allied engineers, whose national caveats may allow the use of persistent antitank mines, will be authorized to use them under the rules of engagement established for the operation—and whether those units will be authorized to conduct obstacle handover/turnover with U.S. maneuver elements of minefields consisting of persistent mines.



Danish engineers provide security while their platoon emplaces an obstacle group.

Developing solutions to the challenges that arise as a result of differing national policies and caveats is a critical component of properly integrating allied engineers. Early discussions of these constraints will ensure that commanders are aware of the challenges and have ample time to develop legal alternatives.

Establishment of effective communications. Establishing effective communications is critical to integrating allied engineers. In addition to the interoperability challenges associated with differing languages, cultures, communications equipment, and mission command systems, other challenges such as the U.S. Army propensity to use acronyms, slang, and other shortcuts compound the difficulty in communicating effectively with allies and partners. As identified from numerous multinational training exercises at JMRC, best practices to mitigate these challenges include—

- Minimal use of acronyms during briefings and radio transmissions. U.S. Army acronym cut-sheets should be issued to allied elements for reference.
- Use of analog operational graphics and obstacle overlays to compensate for differing battlefield command systems.
- Exchange of knowledgeable liaison officers who are integrated into the battle rhythm and are contributors during meetings.
- Collaborative planning and issuance of early warning orders.
- Detailed rehearsals and confirmation backbriefs with allies and partners.

Conclusion

Applying the points made in this article will contribute to creating a greater shared understanding between U.S. Army engineers and our multinational engineer allies and partners. The points can also be applied across all elements within the multinational brigade. Many of the challenges associated with integrating allied maneuver, fires, intelligence, signal, and sustainment elements into a U.S.-led multinational brigade are very similar. Recognizing the challenges associated with effectively integrating allied elements and applying lessons learned to improve the integration process will help us leverage capabilities and contribute to successful future U.S. and NATO operations.

Endnotes:

[1]Army Regulation 34-1, *Multinational Force Interoperability*, 10 July 2015.

[2]NATO STANAG 2036, Ed. 6, *Land Mine Laying, Marking, Recording and Reporting Procedures,* 27 January 2005.

[3]NATO STANAG 2989, *Transfer of Barriers*, 31 January 1985.

[4]Field Manual 3-16, *The Army in Multinational Operations*, 8 April 2014.

[5]"Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction," United Nations Treaty Collection, 18 September 1997, <https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVI-5&chapter=26&lang=en>, accessed on 30 November 2015.

[6]U.S. Department of State—Diplomacy In Action, "U.S. Landmine Policy," <http://www.state.gov/t/pm/wra/c11735.htm>, accessed on 30 November 2015.

Captain Rickard is an engineer observer-coach trainer at JMRC. He holds a bachelor's degree in history from Austin Peay State University in Clarksville, Tennessee. He has served in the Engineer Regiment for 19 years.

Military Personnel Exchange Program: Unique Experience for Army Engineers

By Major Mark R. Allen

The U.S. Army offers a number of interesting jobs in unique locations that sometimes seem mysterious and in nearly unattainable positions in which only privileged individuals get the chance to serve. The Military Personnel Exchange Program (MPEP) falls into these categories. The aim of this article is to remove some of the mystery and to educate junior officers about the MPEP positions available to engineers. It describes the duties and responsibilities of MPEP participants, the personal and professional development opportunities the program offers, the challenges and opportunities of living abroad, and the positions currently available.

The MPEP is governed by Army Regulation (AR) 614-10, *Army Military Personnel Exchange Program with Military Services of Other Nations;* administered by the Department of the Army; and overseen by the Army Deputy Chief of Staff for Operations, Plans, and Training. The regulation covers the major aspects of the program, such as personnel responsible for control; the chain of command structure, objectives, selection criteria, administrative procedures; and financial and legal policies. It lays out four main program objectives:

- Support the priorities of AR 11-31, *Army Security Cooperation Policy*, the Army Security Cooperation Strategy, U.S. Department of Defense guidance, combant command and/or commander campaign plans, and the Army Campaign Support Plan.
- Strengthen alliances and relationships with coalition partners by building partner capacity and maintaining or enhancing relationships in support of a global strategy.
- Increase defense cooperation by integrating U.S. and partner nation military personnel working in valid positions at the unit level.
- Provide a framework through bilateral exchanges of military personnel that prepares officers and noncommissioned officers for future assignments in support of multinational operations.[1]

With the international events that are constantly playing out on the world stage, it is increasingly more important to foster and grow our relationships and ties with our coalition partners.

Individual duties and responsibilities vary depending on the MPEP position. Many are branch-specific, but some are branch-immaterial. AR 614-10 states that "Exchange personnel are given meaningful and responsible assignments commensurate with their grade and qualifications and are integrated into the sponsoring organization as though they belong to the military Service to which they are assigned."[2] This description is somewhat vague because duties and responsibilities can shift, and the exchange officer must be adaptable or risk becoming irrelevant. The MPEP participant is not a liaison officer and should not to be given additional duties that fall outside the partnered nation's job specifications for the position. Typically, there are already liaison officers with the partnered nation's military headquarters, so it would be redundant for the MPEP officer to perform such tasks. Other additional duties might include—

- Hosting senior officers and other officials.
- Writing reports on various topics.
- Attending social or ceremonial events.
- Performing other miscellaneous tasks related to representing the U.S. Army.

Possessing an extroverted personality is not required, but enjoying the many opportunities to engage individuals and groups in various settings is necessary to represent the U.S. Army well. There are almost endless opportunities for self-development for exchange officers. The professional opportunities are easy to identify because supervisors, coworkers, and fellow exchange officers can help develop a list of events to attend and places to visit. Partnered nation representatives want exchange officers to quickly understand the system so they can perform to the best of their abilities. But exchange officers must seek out and create their own opportunities to become regular members of the team. Professional development opportunities can range from attending military lectures and demonstrations to visiting memorials, headquarters, training exercises, or other exchange officers.

While professional opportunities can be limited due to access and security clearances, personal development can be limited by time and funding. It is important for the exchange officer to start a calendar review for the length of the assignment and determine which national events, such as national or international competitions, festivals, or special performances, to attend. Access might be limited, and requests might need to be submitted months in advance. Since MPEP assignments typically last 2 years, prior planning may be critical for special events that take place only once a year.

In addition to opportunities for MPEP participants, there are also challenges that must be overcome. There are the obvious cultural and linguistic barriers for assignments in a non-English-speaking country. (I have found that there are challenges in understanding the culture and language even while serving with the British Army—despite sharing

"Professional development opportunities can range from attending military lectures and demonstrations to visiting memorials, headquarters, training exercises, or other exchange officers."

the same language.) Most of the challenges arise from deciphering military acronyms and structures and understanding the systems used to handle day-to-day business. There is no doubt that challenges will surface from work, to home, to social settings, and everywhere in between. It is important for the exchange officer to embrace the challenge, learn from it, and make the best effort to resolve or eliminate the challenge for future replacements. In the end, the challenges usually develop into good stories.

Another area that can present a special challenge is that of managing household and living situations. Exchange officers are usually not stationed at U.S. military facilities. This can severely challenge the ability to manage the unique administrative requirements of living abroad, especially for those who are living on the local economy rather than in host nation military housing. Expenses and debt can rapidly accumulate, depending on how quickly administrative paperwork is processed and how promptly government reimbursements are paid. Navigating educational options for children is another hurdle that requires careful consideration. Finally, establishing medical support can present challenges, especially for exchange officers with a Family member who is enrolled in the Army's Exceptional Family Member Program. Tricare® has an international support plan, but there are other possibilities as well. While there may be hardships, there are always solutions if one looks long and hard enough.

On the professional side of the assignment, maintaining a relationship with a senior rater can be difficult. Typically, the exchange officer's rater is an immediate supervisor from the partnered nation. The senior rater is a senior officer from the supporting Army service component command. The U.S. Army Europe deputy chief of staff for engineering serves as the senior rater for engineer MPEP positions in Europe. It can be a struggle to maintain visibility for rating purposes, but regular contact can be sustained by submitting monthly reports, making telephone calls, sending regular e-mail, and making periodic visits. There is MPEP funding for individuals to visit or host their senior raters twice a year. Ultimately, the strength of an exchange officer's report boils down to the relationship fostered with the individual's rating chain.

Staying current and up to date with what is happening within the Engineer Branch and the Army as a whole is another professional challenge. It would be possible for an MPEP participant to completely "unplug" from the U.S. Army, though that would make it difficult for the officer to stay relevant and useful to the partnered nation. In many instances, the exchange officer is that nation's link to the U.S. Army. An exchange officer who is out of touch with doctrine and policy diminishes the relevance and utility of the exchange position.

There are about 134 MPEP positions in the Army, with more than 60 in U.S. Army Europe. Only two of those are engineer positions, both of which are located in the United Kingdom. One is for a senior major serving as an instructor in the British Army engineer school. The other position is for a senior captain serving as an observer-controller. Both of these positions have been filled by engineer officers for more than 20 years. Another continuously filled MPEP engineer position is for an exchange officer in Australia. Interested individuals should talk to their Human Resource Command assignment officer about filling one of these assignments. The assignment officers are responsible for submitting the initial recommendations to fill the slots. Recommendations must be approved by the Department of the Army and the host nation.

The background and performance of the applicant are key items that influence the decisionmaking process. Ideal candidates have platoon to battalion staff officer experience in an engineer battalion. Time spent in a training environment, such as the National Training Center, Fort Irwin, California; the Joint Readiness Training Center, Fort Polk, Louisiana; the Joint Multinational Readiness Center, Hohenfels, Germany; or the U.S. Army Engineer School, Fort Leonard Wood, Missouri, adds value and credibility. Completing leadership training such as the Sapper Leader Course or U.S. Army Ranger School also enhances an applicant's profile and demonstrates a willingness to take on challenges. Lastly, an officer's performance is an important factor in the selection process because those who hold MPEP positions are a reflection of the U.S. Army Engineer Corps and the U.S. Army.

The MPEP offers unique and rewarding opportunities for those given the privilege to represent the U.S. Army. Exchange officers learn about the commitment and professionalism of the armies of our partnered nations and gain a better understanding of the stature of the U.S. Army. Interested officers should contact their branch managers and make their interest known before their assignment cycle.

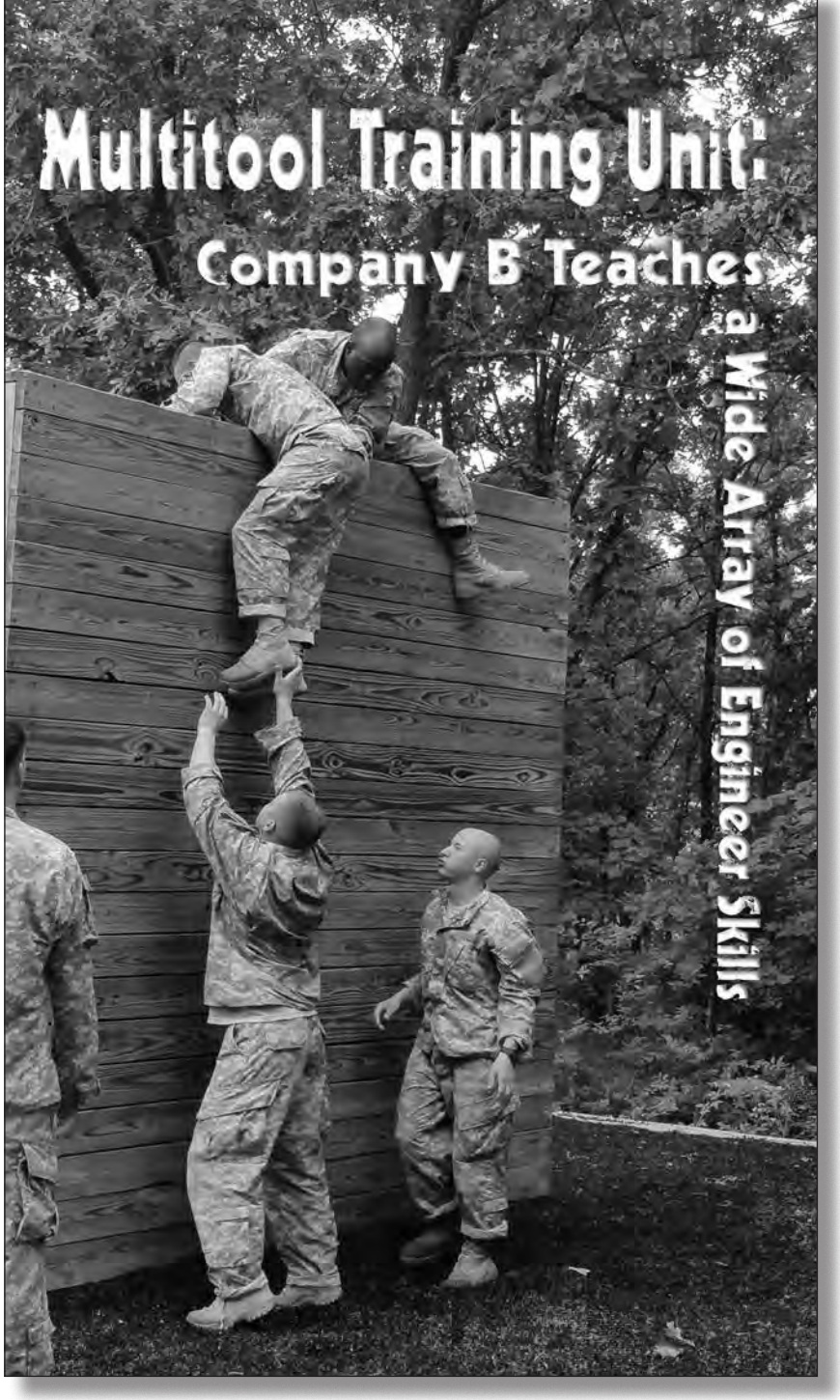
Cheers!

Endnotes:

[1]AR 11-31, *Army Security Cooperation Policy*, 21 March 2013.

[2]AR 614-10, *Army Military Personnel Exchange Program with Military Services of Other Nations*, 14 July 2011.

Major Allen is an MPEP exchange officer serving as an instructor at the Royal School of Military Engineering. He holds a bachelor's degree in systems engineering from the U.S. Military Academy–West Point, New York; and a master's degree in engineering management from Missouri University of Science and Technology at Rolla.



By Captain Andrew G. L. Taylor, First Lieutenant Daniel C. Sherman, and Staff Sergeant Jared S. Wenzel

A typical advanced individual training (AIT) company trains a single military occupational specialty (MOS). Company B, 169th Engineer Battalion, Fort Leonard Wood, Missouri, trains about 1,300 members of the U.S. Army, U.S. Marine Corps, U.S. Navy, U.S. Air Force, and the militaries of allied partners every year in a variety of diverse engineer skills. The company also has administrative control of the battalion headquarters and the Sapper Leader Course. This article provides a description of each MOS taught by Company B, some lessons learned, and initiatives that can aid in the U.S. Army credentialing effort.

12D–Army Diver

Diver candidates begin with Phase I at Fort Leonard Wood, with only the most qualified proceeding to Phase II training at the U.S. Army Dive School in Panama City, Florida. Phase I Diver School is a physically rigorous, 14-day course. On Day 1, diver candidates take a drown-proofing test and a fitness test that consists of a 500-yard swim within 14 minutes, 42 push-ups in 2 minutes, 50 sit-ups in 2 minutes, 6 pull-ups, and a 1.5-mile run in less than 12.5 minutes. For the remainder of the 14 days of Phase I, diver candidates chart basic dives in a classroom and study diving physics, gas laws, basic medicine, and anatomy.

Upon the completion of Phase I, candidates move to Panama City to begin the 26-week Phase II course, though some of them face a long wait before making the move. Due to the limited bed space at Panama City, candidates may stay at Fort Leonard Wood for weeks, with the temptation to let physical training slide. The Company B training cadre have created a physical training plan that mitigates stagnation between Phase I and Phase II training, reducing failure rates. Even with the special training plan, only 46 percent of Phase I students graduate from Phase II.

12R–Interior Electrician Engineer

The MOS 12R course is a 6-week program that transforms recent Army basic training graduates into skilled Soldiers who are fully capable of supplying electric power to anywhere from temporary housing in a training environment to a tactical operation center in a theater of operations. Students practice operating the Army 5- and 10-kilowatt generator sets and installing the portable Distribution Illumination System, Electrical. Students learn from experienced civilian and noncommissioned officer instructors with diverse Army engineering backgrounds. Through classroom instruction and hands-on training, Soldiers learn the basics of electrical theory, the installation of service entrance systems, the rough-in of electrical cable and conduit, the troubleshooting of electrical circuits, and the installation of most common electrical devices. An overview of foreign electrical standards and equipment ensures that the new interior electricians are ready to operate overseas. Soldiers pass the course by successfully completing a 52-hour live-power test, in which they must use the skills they have acquired to install a



An AIT platoon sergeant checks out an unmanned aerial vehicle, a piece of new surveying equipment.

complete electrical system, which is then tested by energizing 12 individual circuits. The course has a high graduation rate, with 41 classes numbering a total of 300 students graduating in fiscal year 2015. Course personnel work directly with the 75th Ranger Regiment, training engineer Rangers via a 2-week crash course to prepare for upcoming deployments. Updates to the National Electric Code every 4 years require alterations to the course program of instruction. Most 12R engineers work closely with carpentry/masonry specialists (MOS 12W) and plumbers (MOS 12K) upon arrival at their units. These three MOSs, along with construction engineering supervisors (MOS 12H), represent the core of the Army's vertical-construction capability. These Soldiers are instrumental in force protection and the improvement of Soldier quality of life in the theater of operations. The 12R course proudly sends fully qualified interior electricians to their first duty assignments, ensuring that they can immediately contribute to the mission at hand.

12T–Technical Engineer

Soldiers with MOS 12T are actually technical engineer specialists, but they are usually referred to simply as surveyors. Surveying is the collection of three dimension points (northing, easting, and elevation) and the distance and angles between them. The data represents the location of objects on the earth and is used to make realistic models of the terrain.

That description is a great oversimplification; the moniker of technical engineer specialist is worn as a badge of honor. Surveyors share a lineage with former presidents and the men who paved the way for the expansion of our young Nation. George Washington and Thomas Jefferson once served as surveyor generals of the colony of Virginia, while Abraham Lincoln was a deputy county surveyor in Illinois. There is probably no better example of surveyor courage and tenacity than that of the Corps of Discovery, led by Merriweather Lewis and William Clark. It is an honor to share the same profession as former presidents, Founding Fathers, and intrepid explorers; but surveying represents only one-third of what a 12T technical engineer specialist is trained to do.

A technical engineer specialist is also a draftsman and a geotechnical engineer. It would be difficult to find an individual practicing all three trades in the private sector because for each one, advanced training is required to be recognized as a professional in that field. As a draftsmen, a 12T prepares construction prints that are used for horizontal- and vertical-construction projects. A 12T must be proficient at computer-aided drafting and have a strong working knowledge of the other MOSs within the Engineer Regiment. Geotechnical engineering involves determining the suitability of materials used for construction projects by performing field and laboratory tests that can range from soil tests to determine the adequacy for placing a road, runway, or building foundation to tests of the concrete that might be used to construct a building foundation.

"Surveyors share a lineage with former presidents and the men who paved the way for the expansion of our young Nation."

Any of these highly technical skills alone is important to the success of military engineering operations, but a single Service member who has the skills of all three is an indispensable member of any project team. A 12T learns to seamlessly integrate these skills at the Technical Engineer Course at the U.S. Army Engineer School. The program is relatively new compared to the 240-year Army history; the course did not exist 20 years ago. The specialty previously consisted of four different MOSs—one each for drafting and

materials testing and two separate ones for surveying. The courses lasted an average of 16 weeks each, but advances in technology and automation reduced the time and manpower required to perform tasks that would have otherwise been tedious and time-consuming.

The advances also allowed the courses to be shortened and, eventually, combined. This occurred with the 1994 formation of the Inter-Service Training Review Organization, which brought members of the Army, Marines, Navy, and Air Force together to train as one team under one roof. Today, the 12T course is 17 weeks long, with an average annual course load of 430 inter-Service students, plus allied officers and enlisted Service members. The training time is shared among four phases, which represent each of the originally separate MOSs.

Combining four highly technical specialties comes with its challenges. It is difficult to keep pace with new technology. Before a new piece of equipment touches a student's hands, it must be fielded and added to the program of instruction, which takes a minimum of 3 years. By the time the new equipment is fully integrated into the course, it may already be obsolete. The cost of new equipment and software is also a matter of concern. It costs about $5,000 to install a licensed copy of the software on each of 60 computers used for teaching the drafting phase for two concurrent classes. A new set of surveying equipment costs about $50,000, with three concurrent survey classes requiring 54 sets of equipment. Keeping up with new products that have a 1- or 2-year life cycle would incur astronomical costs, but Army engineer missions don't require that every update be adopted.

12Y–Geospatial Engineer

The origin of geospatial engineers in the military dates back to the American Revolution. George Washington, who acquired his survey experience in the area of Fort Belvoir, Virginia, appointed Robert Erskine as the first geographer and surveyor for the Continental Army in 1777. Tom Hutchins, later retained as "Geographer of the United States," laid out the first ranges of public land in the American West. Lewis and Clark and Zebulon Pike also made noteworthy contributions during this period. The Army commissioned its first geospatial engineers during the War of 1812; by 1816, engineers had helped explore the West and had surveyed coastal fortification sites.

Geospatial engineers continue to learn the latest techniques to accomplish current missions, including the extraction of geospatial data from remotely sensed imagery, field reconnaissance, digital data, existing topographic products, and other collateral data sources. Graduating geospatial engineers can digitize and scan cultural, topographic, and hydrographic features in digital formats. They also develop a concept about how to extract these features using other sources. Entry level personnel can perform detailed analyses of this topographic information by querying, viewing, processing, and analyzing data. They can compile this information into printable maps and other products that can be shared digitally or printed as hardcopy.

Geospatial engineers attend an 18-week course composed of six blocks of instruction. The trainees learn about different types of remotely sensed imagery and digitized graphics,



A civilian instructor briefs Soldiers in the interior electrician course.



An AIT first sergeant shows 12T students troubleshooting techniques.

and they learn to produce geospatial products with the latest software. They are introduced to factor overlays of transportation, hydrology, slope, vegetation, and obstacles; and they observe how they affect military operations on the modern battlefield. A capstone exercise requires that the students use all of the skills they learned throughout the course to create geospatial products to support military briefings and strategic, operational, and tactical products.

AIT Platoon Sergeants

Company B platoon sergeants, instructors, and cadre help Soldiers entering AIT and preparing to leave for duty in U.S. Army Forces Command, Army National Guard, and U.S. Army Reserve units. Platoon sergeants are not simply replacements for basic training drill sergeants. Drill sergeants help recruits develop basic Soldier skills, while AIT platoon sergeants cultivate the complete Soldier in conjunction with MOS-specific training that prepares the Soldier to enter the operational Army. Soldiers learn to communicate their problems with cadre, which prepares them to do the same in the future with their own subordinates. In AIT, platoon sergeants are first-line supervisors on whom the Soldiers depend for answers and guidance. They represent the type of leader that Soldiers should desire to be in their future Army careers.

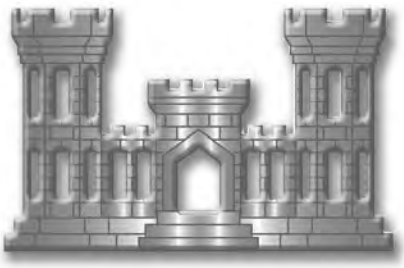
The Way Ahead

Company B is working with officials at the Engineer School and Ozarks Technical Community College, Springfield, Missouri, to help engineer Soldiers earn certificates and/or associate's degrees in their specific fields. The college grants credit for all professional military education, which reduces the number of additional courses required to earn a certificate and/or associate's degree. Soldiers have the opportunity to obtain credentials that are recognized by civilian employers and that will entitle them to pay that is commensurate with their military experience and education. Another Company B initiative involves working with the Engineer School and the National Society of Professional Surveyors to grant MOS 12T graduates a civilian credential that is universally accepted in corporate America. Company B, 169th Engineer Battalion, is a diverse and unique company that stands as the guardian and steward of the engineer profession within the U.S. Army.

Captain Taylor is the commander of Company B, 169th Engineer Battalion. He holds a bachelor's degree in electrical and mechanical engineering from Montana Tech of the University of Montana at Butte and master's degrees in information assurance and computer science from Capitol Technical University, Washington, D.C.

First Lieutenant Sherman is the executive officer of Company B. He holds a bachelor's degree in mechanical engineering from Boston University.

Staff Sergeant Jared S. Wenzel is an instructor-writer for the technical engineer course. He is a graduate of the Technical Engineer Senior Leader Course and is pursuing a bachelor's degree in engineering management from Arizona State University.



Sky Soldiers Provide

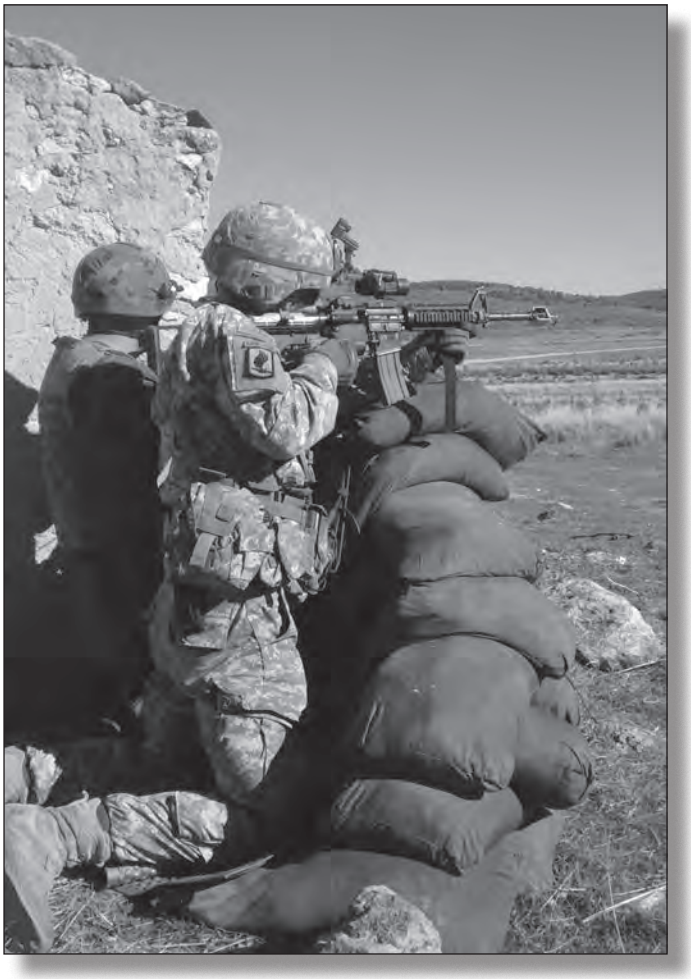
Opposition Force for Exercise Trident Juncture

By First Lieutenant John T. Perry

Soldiers from the 54th Brigade Engineer Battalion were among the U.S. Army's 173d Airborne Brigade paratroopers who joined North Atlantic Treaty Organization (NATO) allies and partners from Spain, Denmark, Italy, and the United Kingdom for the month-long Exercise Trident Juncture from 19 October through 9 November 2015. Trident Juncture, which was the largest combined exercise of its kind, incorporated more than 33 countries and 36,000 participants, showcasing the interoperability and capabilities of NATO partners on a grand scale.

The Company B Soldiers and paratroopers from Troop B, 1st Squadron, 91st Cavalry Regiment, joined troops from the Spanish 47th Light Infantry Regiment, the British 4th Armoured Brigade, the Italian 4th Mechanized Infantry Brigade, and multiple armored units from Denmark to provide opposition forces to engage the light infantry companies as they maneuvered through the Chinchilla National Training Center in southeastern Spain. Throughout the training exercise, the American opposition force exercised engineering and small-unit tactics against the larger assaulting force, which was composed of three armored and mechanized battle groups from the British, Danish, and Italian armies. Due to their smaller numbers, the opposition forces made special use of the expertise they brought to the fight from their specific branches and incorporated enemy tactics, techniques, and procedures that many of them had experienced while fighting in Iraq and Afghanistan.

Engineers created improvised explosive devices at choke points in the terrain to initiate ambushes and constructed large earthen obstacles with concertina wire to block the enemy advance across open ground. The rocky soil in southern Spain enabled the engineers to use the hydraulic picket pounder on their high mobility engineer excavator to emplace more than 1,000 meters of triple-standard



A U.S. Soldier and his Spanish counterpart engage advancing forces from the British 4th Light Dragoons during a training exercise.

concertina wire in just 4 hours after they had completed work on a 2-kilometer engagement area consisting of berms, antitank ditches, and improvised craters.

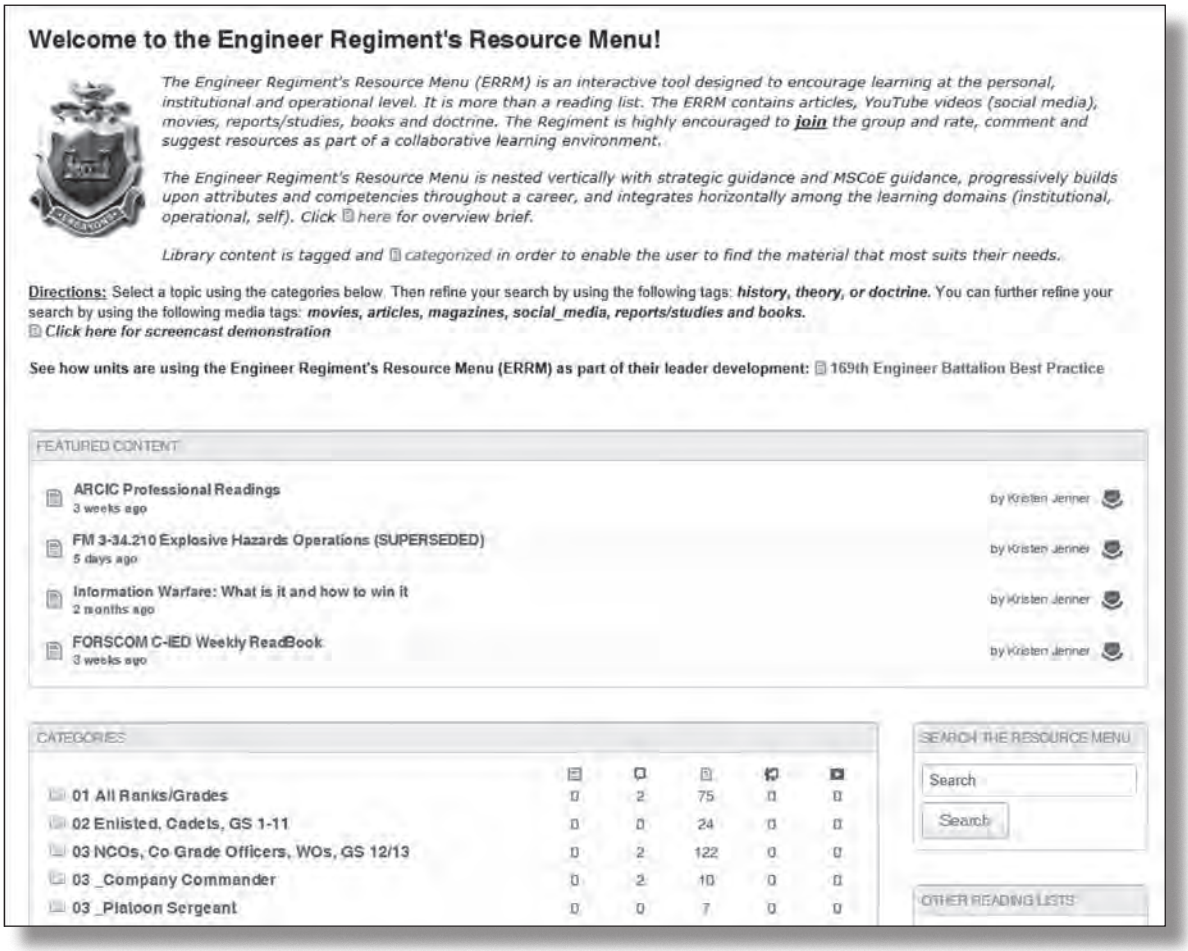
U.S. scouts from Troop B provided reconnaissance and harassment to inflict simulated casualties on the enemy and to create general confusion in their ranks. Spanish infantry troops performed textbook maneuvers throughout the training area, also inflicting a great number of casualties on the larger assaulting force.

The training culminated in a 5-day exercise that demonstrated the tactics each battle group had learned during the previous weeks. Working with NATO allies provided the American paratroopers with a new understanding of combined arms maneuver. The 173d Airborne Brigade is the U.S. Army Contingency Response Force in Europe, and it is capable of deploying ready forces to conduct the full range of military operations across the areas of operations of U.S. European Command, U.S. Africa Command, and U.S. Central Command within 18 hours.

First Lieutenant Perry is the executive officer of Company B, 54th Brigade Engineer Battalion, 173d Infantry Brigade Combat Team (Airborne) at Vicenza, Italy. He is a graduate of the 82d Airborne Division Advanced Airborne School, the U.S. Army Air Assault School, the U.S. Army Airborne School, the Sapper Leader Course, and the Engineer Basic Officer Leader Course. He holds a bachelor's degree of science in biology from Pembroke University in North Carolina.

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ENGINEER DOCTRINE UPDATE

U.S. Army Maneuver Support Center of Excellence
Capabilities Development and Integration Directorate
Concepts, Organizations, and Doctrine Development Division

New Countering Explosive Hazards Doctrine Published

A significant update to engineer doctrine, Army Techniques Publication (ATP) 3-34.20, *Countering Explosive Hazards* (formerly known as Field Manual 3-34.210, *Explosive Hazard Operations*), was published in January 2016. The field manual was identified as having significant issues in effectively describing how combat engineers counter explosive hazards while supporting mobility. Therefore, a team of subject matter experts within the Engineer Regiment, and representatives from across the Army, the U.S. Marine Corps, and the explosive ordnance disposal communities developed a framework that provides engineer leaders with a more clearly articulated way of describing our craft. ATP 3-34.20 addresses the previous concerns with doctrine by moving toward a narrative that is focused on engineers and their efforts across the range of military operations. This new publication also emphasizes the importance of the Engineer Regiment and force using common, accurate language; providing a terminology hierarchy; and emphasizing the hierarchy throughout the framework. This publication will ultimately impact internal engineer publications and some of those being produced by other branches and Services.

To emphasize some of the key changes in the content, this article provides a brief overview of the publication. While this quickly highlights some of the noteworthy updates, leaders should emphasize the importance of reading the doctrine in its entirety as part of professional development for Soldiers.

In establishing the framework, four conditions that cover every situation in which engineers must counter the categories of explosive hazards are identified (see Figure 1). These four conditions are aligned with major engineer tasks (organized by engineer discipline) that the Army requires engineers

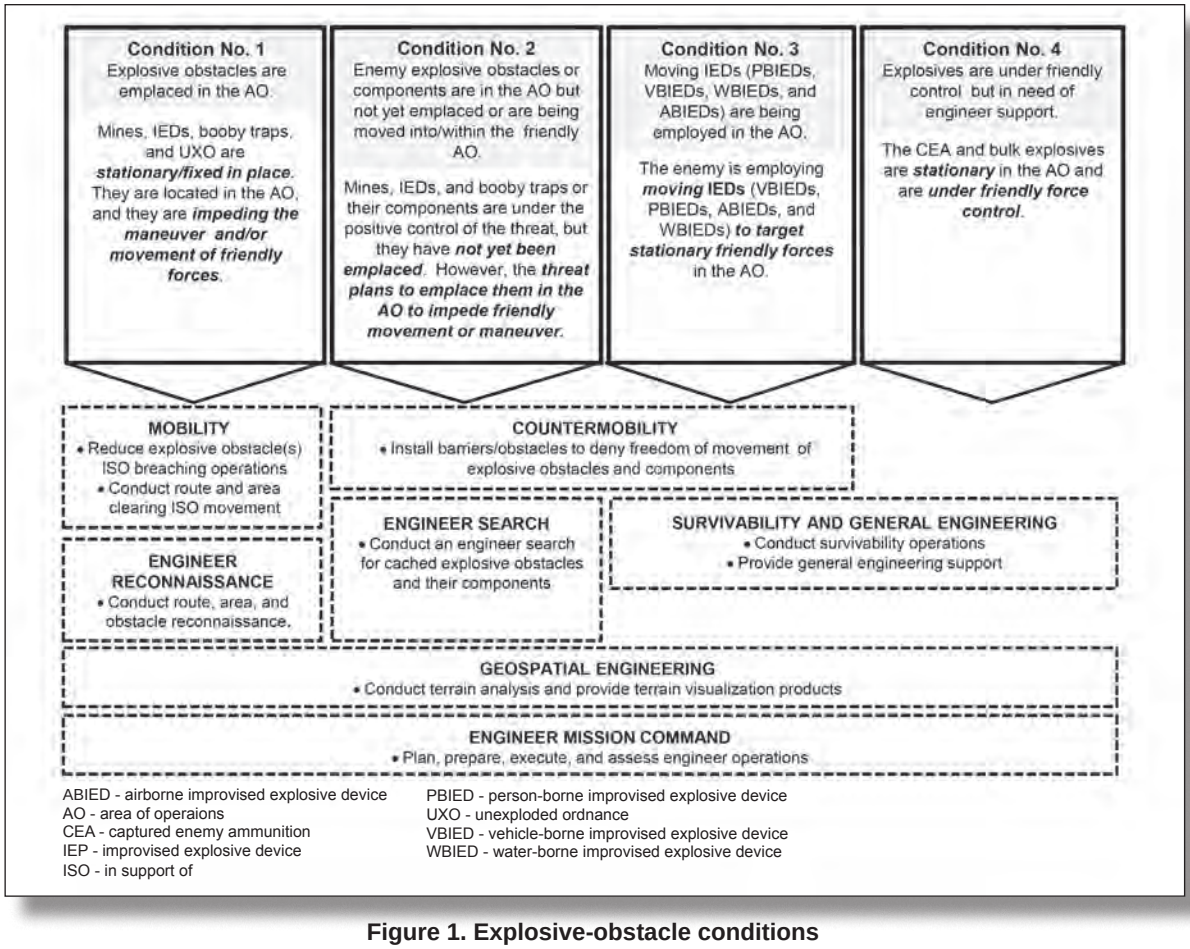


Figure 1. Explosive-obstacle conditions

to conduct to counter explosive hazards. This framework allows engineers to apply their unique capabilities in a logical manner without being overwhelmed by the complexities of the various explosive materials, initiating systems, triggering mechanisms, and other factors. Engineers must understand these conditions and know how to apply the right effort to counter the effects of each condition.

Condition No. 1 is the major focus, and it requires the majority of the combat engineer efforts to counter explosive hazards. It applies throughout the phases in offensive, defensive, and stability operations.

Condition No. 2 varies, depending on its application in offensive and defensive operations versus stability operations. During stability operations, barriers or obstacles may be emplaced to deny the enemy the ability to move mines or explosive booby traps/improvised explosive devices in the area of operations. For example, kilometers of T walls were placed to compartmentalize the Green Zone in Baghdad during Operation Iraqi Freedom. In offensive and defensive operations, combat engineers work within the targeting process to ensure that mine-laying vehicles and other enemy assets are targeted to prevent the placement of explosive obstacles.

Condition No. 3 involves combat engineers countering the employment of improvised explosive devices by executing survivability operations and general engineering to build protective positions and harden structures.

Condition No. 4 differs because the explosives are under the control of, and do not normally pose an immediate danger to, friendly forces. In this condition, engineers typically provide general engineering support such as the construction of berms and fencing. In some cases, engineers may be tasked to assist explosive ordnance disposal personnel in destroying captured enemy ammunition or bulk explosives.

Another of the key features in the new ATP is a figure that shows the complementary capabilities available to counter explosive obstacles. This figure is a snapshot of the primary tasks, normal conditions, and main limitations of warfighters, combat engineers, and explosive ordnance disposal personnel in countering explosive obstacles during mobility. Each of the noted forces has varying capabilities to react to explosive obstacles, beginning with the basic set of skills maintained by the warfighter. Combat engineers and explosive ordnance disposal forces have additional capabilities to respond to explosive obstacles. An understanding of the complementary nature of these capabilities is essential for leaders to properly prepare and execute operations involving explosive obstacles. The figure emphasizes the benefits of synchronizing all three of these forces to ensure the most effective countering of explosive obstacles. In addition to this figure, the publication provides a narrative to address details of the capabilities for each force in offensive, defensive, and stability operations.

Figure 2 summarizes the engineer terminology for countering obstacles in support of maneuver and movement.

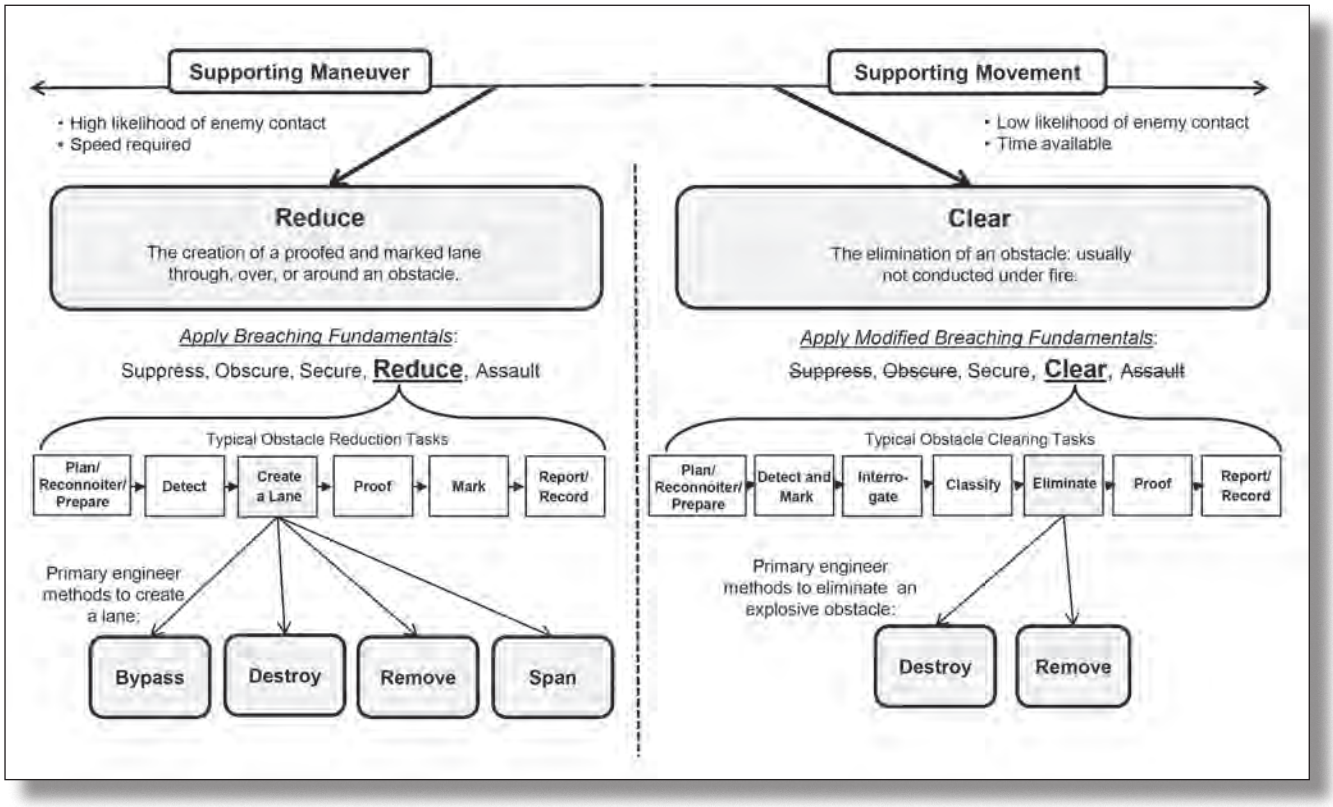


Figure 2. Engineer-obstacle terminology

The intent of this graphic is to ensure that engineers understand the doctrinal terminology and what is meant by terms such as *reduce* or *clear*. Breaching remains the overarching term for the combined arms action, but the engineer part of that operation is to reduce or clear. For instance, reducing an obstacle refers to creating a proofed and marked lane through, over, or around that obstacle. It is not merely the "create the lane" portion of the task. It includes six obstacle reduction tasks and identifies the typical subtasks for reducing an obstacle—bypass, destroy, remove, or span.

Clearing is the elimination of an obstacle, and it is usually not conducted under fire. In contrast to the task of reducing, clearing is a deliberate, combined arms operation that is often much more time-intensive to execute. It results in the complete elimination of the designated obstacle and is typically conducted by engineer units due to their unique equipment, organization, and training.

The delineation of supporting maneuver and movement has been extremely effective in allowing engineers to better understand the terminology, in providing a better understanding of the capabilities available to the maneuver commander, and in explaining what the maneuver commander can expect to see as a result of reducing or clearing.

ATP 3-34.20 clearly explains how combat engineers counter explosive hazards and also refocuses the Engineer Regiment. The doctrinal terminology and introduced framework allow a clear understanding of how engineers should think about explosive hazards.

We continue to ask for your involvement in the Doctrine Sponsorship Program. The program is a great way to ensure that we are receiving current feedback from the field. The publications listed below will be within the revision cycle this year. Sponsors of the publications are also noted. Those who are interested in providing support to the doctrine development and revision process for these or any other publications should not hesitate to contact us.

ATP 3-34.22, *Engineer Operations—Brigade Combat Team and Below*	36th Engineer Brigade
ATP 3-34.45, *Power Generation and Distribution*	249th Engineer Battalion
ATP 3-34.80, *Geospatial Engineering*	Training and Doctrine Command Capacity Manager–Geospatial, Maneuver Support Center of Excellence
ATP 3-37.10, *Base Camps*	555th Engineer Brigade
ATP 3-37.34, *Survivability Operations*	555th Engineer Brigade
ATP 3-90.8, *Combined Arms Countermobility Operations*	20th Engineer Brigade
ATP 3-90.37, *Countering Improvised Explosive Devices*	20th Engineer Brigade

Please contact us if you have any questions or recommendations concerning doctrine.

Lieutenant Colonel Sally C. Hannan, Telephone: (573) 563-2717; e-mail: <sally.c.hannan.mil@mail.mil>.

Mr. Douglas K. Merrill, Telephone: (573) 563-0003; e-mail: <douglas.k.merrill.civ@mail.mil>.

Engineer Doctrine Team, e-mail: <usarmy.leonardwood.mscoe.mbx.cdidcodddengdoc@mail.mil>.

"Doctrine is indispensable to an army. Doctrine provides a military organization with a common philosophy, a common language, a common purpose, and a unity of effort."

—General George H. Decker,
U.S. Army Chief of Staff, 1960–1962



BUILDERS AND THINKERS:

The 307th Brigade Engineer Battalion in Operation Inherent Resolve

By Lieutenant Colonel Patrick J. Sullivan

In December 2014, the 3d Brigade Combat Team (BCT), 82d Airborne Division, Fort Bragg, North Carolina, was ordered to Iraq for a security force (SECFOR) and security force assistance advisor team (SFAAT) mission to support Operation Inherent Resolve beginning in late January. This article outlines the experiences of the 307th Brigade Engineer Battalion during its short train-up and its deployment as Task Force Cobalt. The lessons learned should be useful for future SFAAT rotations in Iraq and for the entire U.S. Army engineer community.

The Mission

The Task Force Cobalt mission was twofold:

- Provide enabler packages across the protection, mission command, sustainment, and intelligence warfighting functions to support BCT maneuver battalions and command posts.
- Advise and assist the Baghdad operations command (BOC), a three-star Iraqi army headquarters that is responsible for the defense of the capital.

The rest of the BCT was responsible for establishing security or building company size partnership capacity (BPC) training units at nine operating locations in Iraq and SFAATs or equivalents from the other five deployed battalions for partnership with Iraqi army commands. Several of the resultant enabler packages—the shadow platoon, the tactical command node platoons, a forward logistics element, and the brigade intelligence synchronization enterprise—generally reflected modified table of organization and equipment and doctrinal employment. Combat engineering support to the SECFOR and BPC companies depended on mission requirements, and these requirements would change over time.

The location and condition of the sites where the BCT would operate in Iraq were unclear at first, so occupying units needed to be prepared to expand their sites. This placed a premium on technical skills in the combat engineering support packages for task force engineers (TFEs) and for the composite sapper squads assigned to the SECFOR and BPC companies. Some of the technical skills were already present in personnel with previous allied trades experience; science, technology, engineering, and mathematics degrees; and engineer professional credentials. These Soldiers were accordingly assigned against requirements.

However, prior experience only got the battalion so far and mission success depended on technical skills. Therefore, the battalion leveraged the engineer entities from various special operations forces on Fort Bragg. The emphasis was on units that specialize in expeditionary base construction and in vertical engineering, with a focus on welding, carpentry, electrical power, heating and air conditioning, and contracting. This focus complemented the composite sapper squads in particular. The squads included two paratroopers who were horizontal-construction engineers. The work with the special operations forces engineers also provided insight into their materiel solutions for specialized tool sets to support bare base builds and promoted interoperability between special operations and conventional forces. In addition, the TFEs and composite sapper squad members were licensed on the interim High-Mobility Engineer Excavator and skid steer loader that were deployed to each site.

The second part of the Task Force Cobalt mission—advising and assisting the BOC—required a trained SFAAT with expertise across the warfighting and staff functions and dedicated operations, plans, intelligence, fires, logistics, training, and command group advisors. Critical thinking skills were a screening criteria for SFAAT membership. Beyond the ill-defined nature of the advise and assist mission, the need for solid critical thinkers came from force manning constraints and distributed mission command requirements. With advising and performing their "day jobs" as section noncommissioned officers in charge, driver/railway transportation officers, platoon leaders, or even company commanders, SFAAT members wore a minimum of two hats. The team was also augmented by the BCT staff and sister battalions for areas of expertise not contained within

the team. This included two infantry captains and a fire support coordination cell for maneuver and fires expertise.

Many SFAAT members had never deployed to Iraq, so the team undertook an intensive reading program to bridge the knowledge gap, using the book *Iraq After America*[1] and daily regional news Web sites as primary sources. A leader professional development program was developed to amplify the team's critical-thinking skills. This included readings and exercises from the School of Advanced Military Studies and training in critical thinking and negotiation techniques. These battalion level initiatives nested within the BCT and division level training programs, which included a forum with the Iraq study group from the National Defense University, seminars with the Combating Terrorism Center and West Point Negotiation Project from the U.S. Military Academy, an externally-resourced SFAAT academy, and a home station certifying training event that was supported by the Joint Readiness Training Center, Fort Polk, Louisiana.

The Experience

As the mission evolved, some of the planning assumptions that characterized the enabler packages and SFAAT composition were invalidated. This required the realignment of talent and rethinking of tasks, which revealed the value of the flexibility that was built into the deployed force structure and the adaptability of our leaders. The units supported by the TFEs and the composite sapper squads relied heavily on the technical skills that were emphasized in selection and training. While sappers pulled their share of guard duty in their secondary role of fighting as infantry, the SECFOR mission found them designing and building entry control points, performing base operating support-integrator functions, conducting vulnerability assessments, and overseeing a multitude of local national contracts.

The BPC mission was particularly prominent, as the coalition-enabled collective training model for Iraqi army units culminated with a combined arms breach. TFEs played a significant role in designing, building, and maintaining the obstacle belts for these lanes, and they helped develop programs of instruction for many of the engineer-specific supporting tasks. Sapper squads assigned to BPC companies served as primary trainers. TFEs also performed an outsized role in leveraging the Iraq train-and-equip fund for partnered force development, serving as staff primaries for project requirements, scope-of-work definition, contract letting, and oversight. The TFE assigned to the SFAAT in Irbil, a sergeant first class combat engineer with a project management professional (PMP) credential, was single-handedly responsible for developing the range complex that became the Kurdistan Training Coordination Center and building a battalion size command post. Lastly, several TFEs became high-level advisors when their maneuver battalions served as SFAATs in support of the Ramadi counter-attack, which began in late summer 2015.

The SFAAT's efforts eventually reflected what could be characterized as the *gear model* (see Figure 1), and the emphasis on critical-thinking skills ensured that the battalion had the right people to adapt to any permutation in our advising approach. As the figure shows, there are three gears, connected in sequence, with one bigger than the other two. Each gear corresponds to a major output of the advising approach, and the size of the gears conveys the relative importance of the output to the coalition campaign.

The biggest gear in the sequence—and the one that turned the other two and provided the most important return to the coalition—was the *pulse of the BOC*. The driver for this gear was the command advising that the battalion command group provided to the BOC leaders. The BOC is a

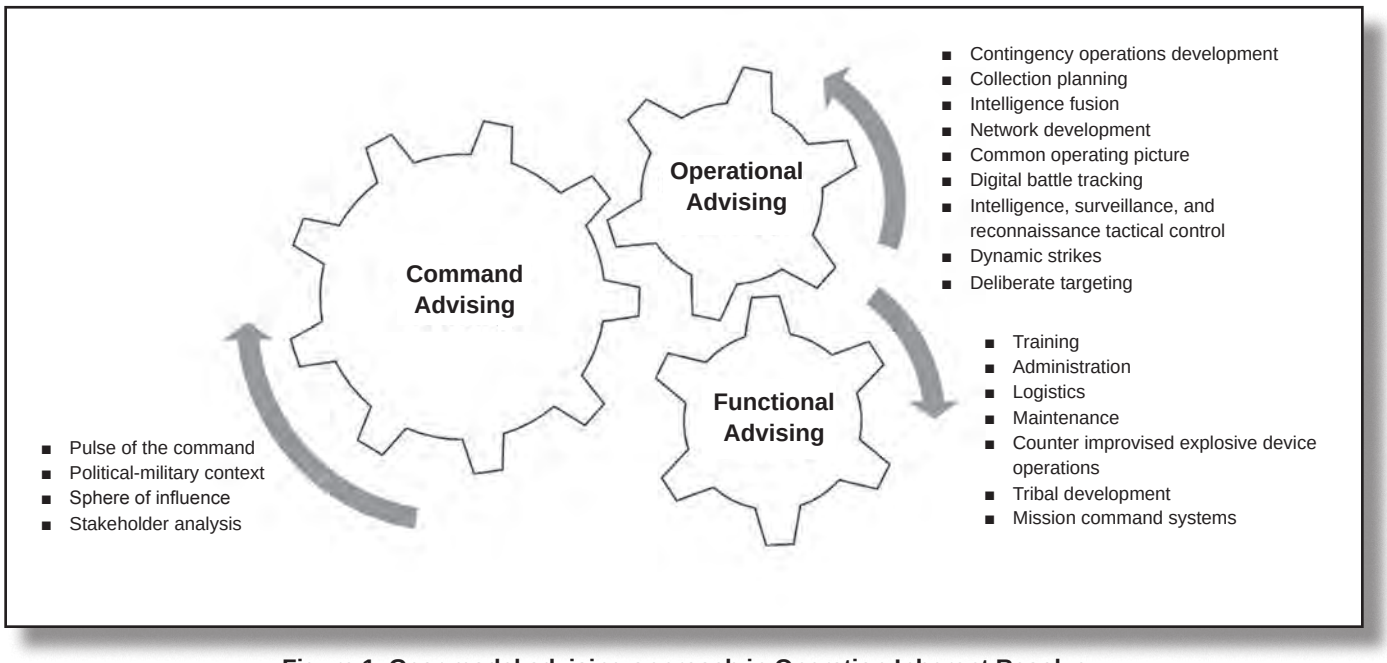


Figure 1. Gear model advising approach in Operation Inherent Resolve

unique and hugely influential organization within the Iraqi security apparatus, with control of a significant percentage of the Iraqi army and Iraqi federal police, broad authority to generate and employ those forces, and access to the highest levels of Iraqi military and political decisionmaking. The battalion relationship with the BOC commander, his principals, and his influencers gave the team a nearly proprietary insight that helped to ensure that the visualization and estimates of the coalition leaders were properly informed.

Because the Iraqi army is commander-centric, the pulse of the command defined the operational priorities of the BOC, which in turn dictated the balance of the battalion advising efforts. This explains the rest of the gear model. The BOC forces are fully deployed against the Islamic State in Iraq and the Levant and criminal elements, fighting daily during the 8 months the team was partnered with them. The BOC commander's foremost priority—the first gear that the pulse of the command turned—was the layered defense of Baghdad. My team dedicated its *operational advising* effort in kind.

This involved a full, daily integration of our plans, operations, fires, and intelligence advisors with BOC counterparts. To access and effectively employ coalition intelligence, surveillance, reconnaissance, and air strikes, the team advisors and their counterparts developed contingency operations and associated collection and targeting plans, then tracked the battle using digital battle command systems. This arrangement allowed the team to provide multiple intelligence, surveillance, and reconnaissance feeds and a common operating picture to the BOC leaders, which aided their mission command and operational environment clearance procedures. It also created a nearly real-time link between the Iraqi commander and the coalition target engagement authority, thereby increasing the responsiveness and accuracy of air strikes. Moreover, the information archived within the common operating picture enabled network development and deliberate targeting efforts that were independent of the often unreliable and hidebound Iraqi human intelligence and that more directly supported the coalition priorities. Our operational advising efforts best illustrate the adaptability at all levels and repurposing of talent that this particular mission demanded.

Although we were command and operational advisors first, *functional advising* (the last gear in the model), which assumed ever greater importance as the mission matured, was directly linked to operational advising. Specifically, the assessment of BOC operations broadcast various demand signals that drove the efforts of our functional advisors. For example, a high casualty rate among BOC explosive ordnance disposal operators prompted a weekly counter improvised explosive device forum to discuss best practices and available coalition-provided training and equipping solutions. Poor operational readiness rates of BOC critical equipment items necessitated special attention to maintenance management within BOC subordinate commands and at national level depots. The sheer size of the BOC force structure made it a necessary customer to sustain the unit training pipeline at the BPC sites, and this rotational plan had to be synchronized with the coalition plan for other Iraqi army units. The BOC commander's plan for local fighters to pacify and resettle Sunni-dominated areas required the funding and training of a tribal resistance force.

There are countless other examples of how operations drove functional advising, but the key distinction is that, while operational advising was mostly an "in-house" solution, every functional advising effort had to be operationalized through some external proponent, either in the Combined/Joint Force Land Component Command, the Combined Joint Special Operations Task Force, or the Office of Security Cooperation–Iraq. Thus, functional advising connected the team back to the collective efforts of the coalition and ensured that command and operational advising remained nested despite the exclusive mission and high degree of independence of the BOC.

Takeaways

Following are some of the lessons learned during the SFAAT mission:

- Short notice can be a good thing since it forces leaders to prudently manage their time and training resources for what is truly essential.
- Leaders must have a clear understanding of where they fit within the bigger picture. I needed to be a force provider to achieve the first part of my mission for this deployment. Within this paradigm, I determined that technical skills would be our greatest potential deliverable to the BCT and that identifying, positioning, and augmenting these skills had first priority in our preparation for the mission.
- It is necessary to have a clear identity as an SFAAT. Not knowing the frame of reference of our counterparts or how we would nest within the coalition campaign, we had to be prepared to outthink any problem. This is where the focus on critical thinking skills originated. Once we became fully integrated into the mission and gained context for our counterparts, critical thinking helped us recognize when this context had changed (or was about to change) and communicate that change up the advisory chain in a way that influenced the dynamic coalition campaign.
- Critical thinking begat adaptability, which made us formidable advisors. While adaptability is inherent to many types of units, airborne engineer formations have it in abundance, as a byproduct of what we do as engineers and of how airborne units are expected to fight, particularly in the joint forcible-entry setting.

Endnote:

[1]Joel Rayburn, *Iraq After America*, Hoover Institution Press, Stanford, California, 1 July 2014.

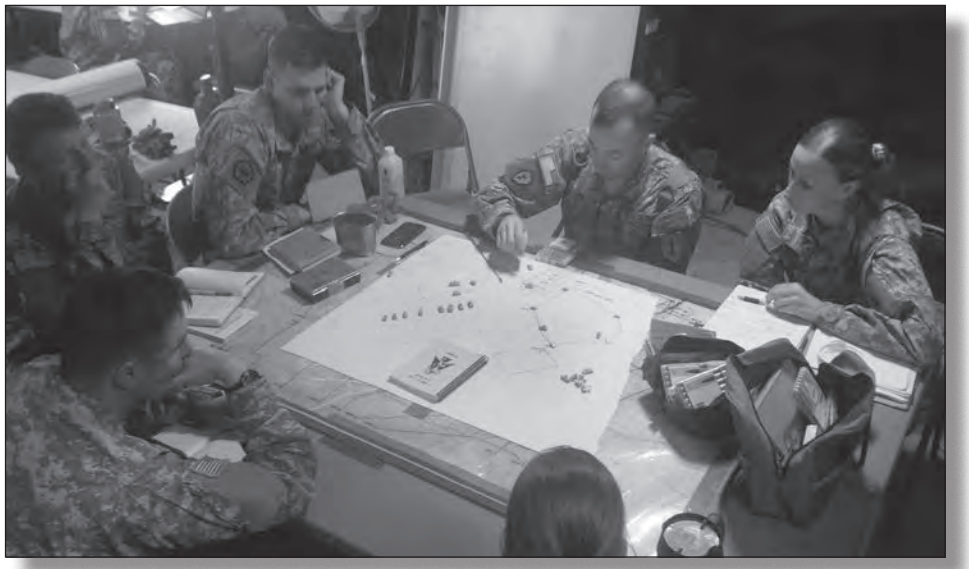
Lieutenant Colonel Sullivan is the commander of the 307th Brigade Engineer Battalion.



Wearing Two Hats
As an Engineer Platoon Leader

By First Lieutenant Cody D. Ikkala

There is a misconception that it is impossible to simultaneously serve as an engineer staff officer and a platoon leader. At the start of a 2015 rotation at the National Training Center, Fort Irwin, California, I was told by an observer-controller that my commander put me in a "horrible position" by expecting me to be a task force engineer and a platoon leader. My experience as a mechanized sapper platoon leader with the 82d Engineer Battalion, 2d Armored Brigade Combat Team, 1st Infantry Division, Fort Riley, Kansas, proved that observer-controller wrong.



82d Engineer Battalion leaders conduct the military decisionmaking process at the National Training Center.

Engineer platoon leaders in the 2d Armored Brigade Combat Team are assigned to support specific task forces with anything involving engineer operations, whether as sappers or infantry Soldiers. Platoon leaders are expected to be experts in all types of engineering to ensure the success of the task force through mobility, countermobility, and survivability. In addition to their tactical knowledge, platoon leaders must also possess four key tenets to be successful:

- Leadership.
- Presence.
- Commitment.
- Trust.

The first requirement for platoon leaders to be successful is an ability to lead. Effective leadership requires the respect of the Soldiers in the platoon. In a 1984 article in *Engineer*, First Lieutenant Louis J. Leto writes, "A platoon leader must learn the significance of this respect. It is his men who determine his success. It is his men who handle the heavy equipment, place the minefields, and dig the tank ditches. If they succeed, the platoon leader succeeds. If they fail, the platoon leader fails. Soldiers will not risk their lives or strive for perfection for a leader they don't respect."[1]

Success starts with the ability of the platoon sergeant to develop squad leaders to execute orders. Once the platoon leader plans the engineer portion of an operation with the task force leaders, the Soldiers of the platoon must begin the necessary movement. This is where the role of the platoon sergeant is so crucial. Right outside the tactical operations center, the platoon leader should be able to give orders to the platoon sergeant, who takes the orders and ensures that they are executed. This allows the platoon leader to continue acting as the task force engineer, refining the plan with task force leaders.

Knowing when to step out from under the task force engineer hat and put on the platoon leader hat is a leadership challenge. This decision allows the platoon leader to motivate, direct, and influence his or her Soldiers and perhaps become aware of overlooked terrain features or unforeseen obstacles. This observation from a different perspective can allow the platoon leader to go back and refine the plan with task force leaders once the decision is made to switch hats once again.

Another part of the leadership tenet is the ability of the platoon leader to be firm, confident, and directive. An operation involves a huge flow of information, changes in plans, and conflicting demands on leaders. The platoon leader can solve this leadership challenge by being present at the most decisive location. For example, the platoon may be moving to a new location at the same time the task force leadership is



An element of the 2d Armored Brigade Combat Team lines up to assault its objective.

putting out the timeline for the military decisionmaking process, issuing mission assignments, and developing courses of action. The platoon leader must be willing to trust junior leaders and the platoon sergeant to conduct the movement without direct supervision.

Presence is another tenet necessary for the success of a platoon leader in the role of task force engineer. The tenet of presence starts early on, when meeting the task force commander, command sergeant major, and operations officer. The confidence established at that meeting will determine how much the platoon leader will be trusted and how much of his or her expertise will be incorporated in the planning process. Getting involved in that process means finding the key tactical operations center personnel who will help the platoon leader fulfill the commander's vision. Operations officers are a good first choice because they oversee the section that advises the commander on how to use the engineer assets available. Once that linkup is made, it is important that the platoon leader tie into the planning with all task force staff sections. Synchronization should be the mantra of engineers involved in any mission. Once the engineer plan has been completed and briefed to the task force commander, the promised product must be delivered. Obstacles, survivability positions, route reconnaissance packages, and any other requirements must be executed to standard and synchronized with the task force scheme of maneuver.

Commitment is another crucial tenet of simultaneously acting as a task force engineer and a platoon leader because the dual task requires expertise in mobility, countermobility, and survivability. As an engineer officer, the platoon leader must be aware of the capabilities of the personnel in the platoon and in other inorganic engineer units attached to the company headquarters. Before our rotation at the National Training Center, I consulted other platoon leaders in an attempt to fully understand the company's horizontal and breaching assets and I compiled a smart book that included information about each piece of equipment available. When task organizations were issued and the task force was assigned additional assets, the book enabled us to provide the maneuver commander with accurate, timely estimates of what could be accomplished with the assets so that decisions could be made earlier in the military decisionmaking process.

One of the most significant lessons learned at the National Training Center rotation was to expect the unexpected. Late in the planning cycle, we received a fragmentary order from the brigade attaching two bulldozer blade teams that would be responsible for constructing an antitank ditch. I made the mistake of thinking that the inorganic teams were as efficient as our organic teams, but they didn't complete the job as expected. This left a gap in our defenses that could easily have been exploited. It is essential for a task force engineer to understand the capabilities of the equipment assigned to the task force, even if the equipment is not organic to his or her platoon.

The final, and perhaps most important, tenet needed to perform both as a task force engineer and a platoon leader is trust, which is a product of the other tenets of leadership, presence, and commitment. The role of a task force engineer who falters in any of these qualities will likely be minimized during the planning process, and he or she will be unable to contribute to the team effort. There is much to be said about trust in many different scenarios; it is what our profession is all about. When you have earned a person's trust, you have also earned his or her respect.

Endnote:

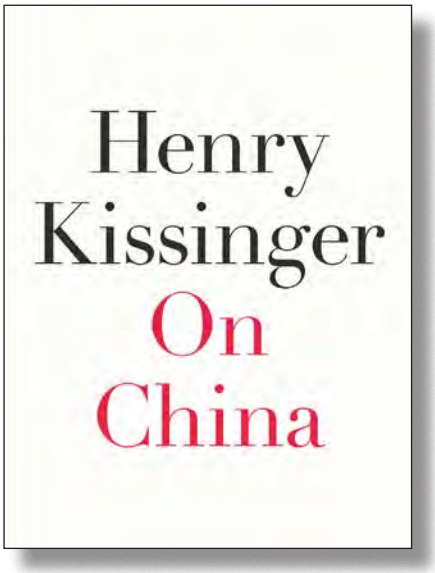
[1]Louis J. Leto, "Success Through Respect," *Engineer*, Volume 14, Number 1, Spring 1984, pp. 36–37.

First Lieutenant Ikkala is the executive officer of Company B, 82d Engineer Battalion. He holds a bachelor's degree in honors environmental geography from the U.S. Military Academy–West Point, New York.

Book Review

Self-development is a major pillar in the growth of Army leaders. One tool to aid in this is the "Engineer Commandant's Reading List" at <http://www.wood.army.mil/usaes/library/documents/ENGR_CMDT_READING_LIST_2012.pdf>. It includes a variety of books on history, politics, and culture that are appropriate for Soldiers and civilians in the Engineer Regiment. The list is not all-inclusive and will be updated over time.

Book reviews are a feature in each issue of *Engineer*. Authors of book reviews summarize the contents of books of interest and point out the key lessons to be learned from them. Readers who wish to submit book reviews may forward them to <usarmy.leonardwood.mscoe.mbx.engineer@mail.mil>.



On China, by Dr. Henry Kissinger, Penguin Books, 17 May 2011, ISBN 9781594202711

Reviewed by Staff Sergeant William W. Greer

Recent military developments in the Pacific should motivate Department of Defense personnel to learn about and understand China, the giant of the region. From conflicts with smaller neighbors over disputed territories and islands to its military modernization and economic development, China exerts a major influence throughout the world today. However, China's current position as a world leader came at great cost and sacrifice, as the result of tenacity and perseverance. Anyone interested in China's development, especially in modern times, will want to read this book of wisdom and insight presented by the diplomat and Nobel Peace Prize winner, Dr. Henry Kissinger. In this engrossing study, Kissinger leads the reader to an understanding of modern China from its historical and cultural roots. What emerges is a lucid, intriguing study that reads in several dimensions. The book ranges from a historical study of facts and events; to a personal glimpse into the personalities and motivations of 20th century Chinese, Soviet, and American leaders and diplomats; to interpretation and hopes for future relations between the United States and China.

The opening chapters provide detailed descriptions and interpretations of historical events to help understand modern China in perspective. The author confesses that presenting Chinese history would require oversimplification, so he confines the historical sketch to the minimum necessary for understanding modern Chinese foreign policy. He explains the nation's cultural and governmental roots in Confucianism and explains the strategic game of *Go,* "encircling game," contrasting it with the Western game of chess. Whereas *Go* emphasizes subtlety and advantage, chess is about domination and total victory. Kissinger reflects on Sun Tzu's *The Art of War*[1] and shows how the military philosopher and strategist implemented elements of *Go* in his book. Interestingly, China long cultivated its domestic politics and statecraft while largely avoiding the development of a foreign policy. Not until China was humiliated by European powers in the 19th century did it have to define and form a foreign policy. In developing a foreign policy, Chinese leaders hearkened to the skills and strategy of *Go*, using indirect attacks and the patient accumulation of advantage to avoid encirclement and domination, thus maintaining strategic equilibrium. When facing groups of opponents that were not playing by China's rules, its leaders found weaknesses in the opponents and played one against the other. Dr. Kissinger traces this strategy through several key historical events, such as conceding rights to Russia in Manchuria, which directly conflicted with Imperial Japanese ambitions and culminated in the 1904–1905 Russo-Japanese War. In more modern times, similar strategies were employed when dealing with the two competing nuclear superpowers of the Cold War—the United States and the Soviet Union. The approach is still relevant in China's current political and military aspirations.

In presenting events after the Chinese Communists came to power in 1949, Dr. Kissinger traces the political and military strategy of the Soviet Union and the United States and their relationships to China. He focuses on explaining the key events (the Korean War, the Vietnam War, and successive crises over the island of Taiwan) that involved the three

powers. Dr. Kissinger presents the geopolitical strategies and games of the three powers with keen insight and poignancy, tinged with wit and frankness. He also shows how the Chinese, without nuclear weapons, maintained military equity with the two nuclear powers. Of particular interest to the American student of military history are the decisions that led China to intervene in the Korean War. That intervention was the result of China's perception that the United Nations, led by the United States, wanted to establish bases along China's borders, leaving China militarily vulnerable. He does not provide as much detail regarding China's involvement in the war in Vietnam, except to explain it in terms of a foreign power once again setting up strategic bases on China's periphery and thus threatening stability in the region.

The author does present detailed information about the third Vietnam War. China's 1979 invasion of Vietnam was meant to prevent a regional rival from threatening China's central role in Asia. It had the added benefit of leaving the Soviet Union, which had provided immense sums of money and military equipment to Vietnam, defunct as a power in Asia. The war resulted in the enormous loss of Chinese life, in numbers that Western nations would find untenable. Though some historians and analysts believe that the third Vietnam War was a failure, Dr. Kissinger writes that it brought about two changes in history. It heralded the decline of the Soviet Union as a world power, and it forced a weakened Vietnam to dedicate a large troop presence (with all its expenses) to duty on the Chinese border. This left Vietnam with few resources to dedicate to its other Indochinese aspirations, thus preventing China from being threatened on its frontiers by a foreign power.

Citing personal transcripts from meetings with China's leaders, Dr. Kissinger presents a fascinating glimpse into the lives of prominent Chinese leaders, especially Chairman Mao Zedong, Zhou En Lai, and Deng Xiao Ping. He portrays Mao Zedong as wanting to force history with continual revolutions, which brought disastrous results such as the Great Leap Forward (and its accompanying famine) from 1958 to 1961 and the decade-long Cultural Revolution from 1966 to 1976. Dr. Kissinger's assessment of Mao's right-hand man, Zhou En Lai, is more flattering, as he admired Zhou's strong skills in statesmanship and diplomacy. As a practical administrator, Zhou reluctantly turned Chairman Mao's theories into reality, causing millions of deaths in the famine. He avoided being purged as a leader during Chairman Mao's lifetime, but was marginalized by the time he died.

Dr. Kissinger reserves his greatest admiration for a man who never held the position as head of state or leader of the Communist Party. The enigmatic Deng Xiao Ping emerged as China's de facto leader when Zhou En Lai's successors, the Gang of Four, were purged. Deng the Reformer enacted the modernization measures first proposed by Zhou En Lai, but Deng the Tyrant later crushed the demonstrators in Tiananmen Square when they demanded more freedoms and reforms. Kissinger is struck by the resiliency and determination of the Chinese people, who continually emerge stronger and more unified after their roller coaster rides through history.

While presenting the leaders of China after 1949, Dr. Kissinger also describes the personalities and aspirations of Soviet leaders such as Josef Stalin, Nikita Khrushchev, and Leonid Brezhnev as they developed Soviet policy toward Asia and the rest of the world. The awkward meetings between Mao and Stalin, and then Mao and Khrushchev, are particularly interesting; and they present Mao's strength and determination to push his country to relevancy on the world stage.

The final chapters of *On China* deal with more recent trends and developments, focusing on the transition to the next generation of leaders, from Jiang Zemin to Hu Jintao, the Paramount Leader of China from 2002 until 2012. Dr. Kissinger feels that China's leaders are holding a course dedicated to Marxist socialism, remaining true to Maoism, and reconciling the course of their nation with modern history and economics. He illustrates how modern events in the Pacific region appear to mimic the events of 19th- and 20th-century Europe that led to conflict. However, he remains optimistic that the lessons of statesmanship and foreign policy will prevail and that peace and mutual cooperation will grow, despite differing world views and political systems.

Anyone interested in China's development and rise from a Third World nation to a modern economic and military power should read this book to gain a deeper appreciation of modern U.S.-China relations. As our military focuses on the Pacific, the book yields insight into our relationships with nations of the Pacific region and our role in the military, commercial, and political events that occur there. The military professional will find the chapters dedicated to the Korean War, the Taiwan crises, and the third Vietnam War to be of particular interest from strategic and operational perspectives. Because the book can be read on different levels, it sheds light on historical events and facts, presents sketches of prominent personalities, and describes the world views of some of the most intriguing political figures of the 20th century. The book can be dense and slow going at times, but well worth the effort. Upon finishing the work, readers will be compelled to go back and revisit sections of particular interest and reflect on the development of U.S.-China relations in light of current events.

Endnote:

[1]Sun-tzu, *The Art of War*, Filiquarian Publishing, LLC., Lewiston, New York, 7 November 2007, ISBN-13: 978-1599869773.

Staff Sergeant Greer is a training developer in the Directorate of Training and Leader Development at the U.S. Army Engineer School, Fort Leonard Wood, Missouri. He holds a master's degree in German language and literature from The Ohio State University.



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